

PARTS AND MAINTENANCE MANUAL

For AIR HOIST WITH TROLLEY

**LC2A015SIP3LVU..-E & LC2A030DIP3LVU..-E
LC2A015SIP3LVU..& LC2A030DIP3LVU..
LCA030SIP3LRU..-E / LCA060DIP3LRU..-E
LCA060DIP2LGU..-E / LCA070DIP3LRU..-E
LCA080DIP3LRE..-E
LCA060SIP3LRE..-E / LCA060SIP3LRN..-E
LCA120DIP3LRE..-E / LCA120DIP3LRN..-E
LCA250QIP3LRE..-E / LCA250QIP3LRN..-E**

READ THIS MANUAL BEFORE USING THESE PRODUCTS. This manual contains important safety, installation, operation information. Make this manual available to all persons responsible for the operation, installation of these products.

WARNING

Do not use this hoist for lifting, supporting, or transporting people or lifting or supporting loads over people.

Always operate, inspect and maintain this hoist in accordance with European or National Standards Safety Code and any other applicable safety codes and regulations.

Refer all communications to the nearest Ingersoll-Rand Material Handling Products Office or Distributor.

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SAFETY INFORMATION

This manual provides important information for all personnel involved with the safe installation, operation and proper maintenance of this product. Even if you feel you are familiar with this or similar equipment, you should read and understand this manual before operating the product.

Danger, Warning, Caution and Notice

Throughout this manual there are steps and procedures which, if not followed, may result in injury. The following signal words are used to identify the level of potential hazard.

DANGER

Danger is used to indicate the presence of a hazard which *will* cause *severe* injury, death, or substantial property damage if the warning is ignored.

WARNING

Warning is used to indicate the presence of a hazard which *can* cause *severe* injury, death, or substantial property damage if the warning is ignored.

CAUTION

Caution is used to indicate the presence of a hazard which *will* or *can* cause *minor* injury or property damage if the warning is ignored.

NOTICE

Notice is used to notify people of installation, operation or maintenance information which is important but not hazard-related.

Safety Summary

WARNING

- **Do not use this hoist or attached equipment for lifting, supporting, or transporting people or supporting loads over people.**
- **The supporting structures and load-attaching devices used in conjunction with this hoist must provide and adequate safety factor to handle the rated load, plus the weight of the hoist and attached equipment. This is the customer's responsibility. If in doubt, consult a qualified structural engineer.**

The National Safety Council, Accident Prevention Manual for Industrial Operations, Eighth Edition and other recognized safety sources make a common point.

Employees who work near cranes or assist in hooking on or arranging a load should be instructed to keep out from under the load. From a safety standpoint, one factor is paramount : conduct all lifting operations in such a manner that if there were an equipment failure, no personnel would be injured. This means keep out from under a raised load and keep out of the line of force of any load.

To our interpretation, INGERSOLL-RAND Material Handling hoists are manufactured in accordance with the latest standards.

However, contrary to common belief, as we understand it, generally places the burden of compliance with the user, not the manufacturer. Many requirements are not concerned or connected with the manufactured product but are, rather, connected with the final installation. It is the owner's responsibility and user's responsibility to determine the suitability of a product for any particular use. Check all applicable industry, trade association, federal, state and local regulations. Read all operating instructions and warnings before operation.

Rigging : It is the responsibility of the operator to exercise caution, use common sense and be familiar with proper rigging techniques.

NOTICE

- **INGERSOLL-RAND Replacement Parts are specifically designed to ensure optimum performance of your equipment. Use of other than genuine INGERSOLL-RAND Material Handling parts may adversely affect safe operation and will invalidate the warranty.**

SAFE OPERATING INSTRUCTIONS

The following warnings and operating instructions are intended to avoid unsafe operating practices which might lead to injury or property damage.

INGERSOLL-RAND recognizes that most companies who use hoists and trolley safety program in force at their facility. In the event that some conflict exists between a rule set forth in this publication and a similar rule already set by an individual company, the more stringent of the two should take precedence.

Safe Operating Instructions are provided to make an operator aware of dangerous practices to avoid and are not necessarily limited to the following list. Refer to specific sections in the manual for additional safety information.

Refer to the hoist manual for additional precautions and instructions.

1. Only allow qualified people (trained in safety and operation) to operate the hoist.
2. Only operate a hoist and a trolley if you are physically fit to do so.
3. When a "DO NOT OPERATE" sign is placed on the hoist controls, do not operate the hoist until the sign has been removed by designated personnel.
4. Before each shift, the operator should inspect the hoist and the trolley for wear or damage.
5. Never use a hoist and a trolley that inspection indicates is defective.
6. Periodically, inspect the hoist and the trolley thoroughly and replace worn or damaged parts.
7. Lubricate the hoist and the trolley regularly.
8. Using the hoist, only lift loads less than or equal to the lower rated capacity of the trolley or hoist.
9. Only attach a hoist having a rated capacity equal to or less than the capacity of the trolley.
10. When using two hoists to suspend one load, select two trolleys each having a rated capacity equal to or more than the load. This provides adequate safety in the event of a sudden load shift or failure of one trolley.
11. Never place your hand inside the throat area of a hook.
12. Only operate a hoist when the load is centered under the hoist. Do not "side pull" or "yard".
13. Pay attention to the load at all times when operating the trolley.
14. Make sure all people are clear of the load path. Do not lift a load over people.
15. Never use the hoist for lifting or lowering people, and never allow anyone to stand on a suspended load.
16. Do not swing a suspended load.
17. Never suspend a load for an extended period of time.
18. Never leave a suspended load unattended.
19. Never weld or cut a load suspended by the trolley.
20. Always rig the load properly and carefully.
21. Remove all loads before performing any maintenance.
22. Avoid collision or bumping of hoist and trolley.
23. After use, properly secure hoist and all loads.

INSTALLATION

Prior to installing the hoist, carefully inspect it for possible shipping damage. Hoists are supplied fully lubricated from the factory. Lubrication of the load chain is recommended before initial hoist operation.

CAUTION

- Owners and users are advised to examine specific, local or other regulations, including American National Standards and/or OSHA Regulations which may apply to a particular type of use of this product before installing or putting hoist to use.

WARNING

- A falling load can cause injury or death. Before installing, read "Safety Information."

Mounting

Make certain your hoist is properly installed. A little extra time and effort in doing so can contribute a lot toward preventing accidents and helping you get the best service possible.

Always make certain the supporting member from which the hoist is suspended is strong enough to support the weight of the hoist plus the weight of the maximum rated load plus a generous factor of at least 500% of the combined weights.

If the hoist is suspended by a top hook, the supporting member should rest completely within the saddle of the hook and be centered directly above the hook shank. Do not use a supporting member that tilts the hoist.

Hook Mounted Hoist

Place hook over mounting structure. Make sure hook latch is engaged.

Trolley Mounted Hoist

When installing a trolley on a beam, measure the beam flange and temporarily install the trolley on the hoist to determine the exact distribution and arrangement of the spacers. The total distance between the wheel flanges should be 3/16 in. to 1/4 in. (4.76 mm to 6.35 mm) greater than the width of the beam flange.

The number of spacers between the trolley side plate and the mounting lug on the hoist must be the same in all four locations in order to keep the hoist centered under the I-beam. The remaining spacers must be equally distributed on the outside of the side plates. (For additional information refer to the trolley manufacturer's literature.)

WARNING

- At least one mounting spacer must be used between the head of each trolley bracket bolt and the trolley bracket and between each trolley bolt nut and the trolley bracket. Failure to do this could cause the hoist to fall when used improperly.

Ensure the trolley bolts or nuts are torqued in accordance with manufacturer's specifications. When installing the hoist and trolley on the beam, make certain the side plates are parallel and vertical. After installation, operate the

trolley over the entire length of the beam with a capacity load suspended 4 to 6 inches (10 to 15 cms) off the floor.

CAUTION

- To avoid an unbalanced load which may damage the trolley, the hoist must be centered under the trolley.

NOTICE

- Trolley wheels ride on the top of the lower flange of the beam.

Air System

The supply air must be clean, lubricated and free from moisture. A minimum of 90 psi (6.3 bar/630 kPa) at the hoist motor is required to provide rated hoist capacity. Air inlet port size for LCA015S and LCA030D units is 1/2 in. BSP. On all other units the inlet port size is 3/4 in. BSP.

Air Lines

The inside diameter of the hoist air supply lines must not be smaller than 3/4 in. (19 mm). Before making final connections, all air supply lines should be purged before connecting to system inlet. Supply lines should be as short and straight as installation conditions will permit. Long transmission lines and excessive use of fittings, elbows, tees, globe valves, etc. cause a reduction in pressure due to restrictions and surface friction in the lines.

Lubricator

The air motor may be operated without lubrication. If an air line lubricator is used, it should be replenished daily with SAE 30W Grade ISO VG 100 oil (minimum viscosity 135 Cst at 104° F (40° C)).

CAUTION

- Shut off air supply before filling air line lubricator.

Filter

It is recommended that an air line strainer/filter be installed within 3 ft (1 m) of the motor air inlet port to prevent dirt from entering the motor. The strainer/filter should provide 20 micron filtration and include a moisture trap. Clean the strainer/filter monthly to retain its operating efficiency.

Moisture in Air Lines

Moisture that reaches the air motor through the supply lines is the chief factor in determining the length of time between service overhauls. Moisture traps can help eliminate moisture. Other methods, such as an air receiver which collects moisture before it reaches the motor or an aftercooler at the compressor that cools the air prior to distribution through the supply lines are also helpful.

Motor

For optimum performance and maximum durability of parts, operate the air motor within the operating specifications provided in the "SPECIFICATIONS" section. The air motor should be installed as near as possible to the compressor or air receiver.

Overload Device

Overload protection is integrated into the motor body and is standard on -E versions. The overload system is based on detection of the difference in air pressure between the inlet and outlet ports. It consists of a valve which is normally closed. The valve senses pressure at the motor inlet and outlet and compares the difference between the two pressures to the index value established by spring adjustment. A difference in pressure greater than the index value causes the emergency stop to be activated. This then exhausts the air and hoist operation stops.

Overload protection is adjusted at the factory to 120% of the safe working load (SWL). It is also able to operate on both sides for mining versions with two bottom hooks. Refer to the "MAINTENANCE" section for adjustment procedures.

Main Air Shut-off Valve

The main air shut-off valve is completely integrated into the motor body and is standard on -E versions.

Chain container

1. Check the chain container size to make sure the length of the load chain is within the capacity of the chain container. Replace with a larger chain container if required.
2. When a chain bucket is used, Install a chain buffer on the 15th link from the end of the chain.
3. Attach the chain container to the hoist.
4. Run bottom block to the lowest point and run hoist in the "UP" direction to feed the chain back into the container.

NOTICE

- Allow chain to pile naturally in the chain container. Piling the chain carelessly into the container by hand may lead to kinking or twisting that will jam the hoist.

Attaching Limit Stop

1. On hoists without a chain bucket, slide buffer and washer onto chain.
2. Install limit stop as described under "Chain Container".
3. Run hoist slowly in the "DOWN" direction to verify limit stop activates cutout.

Storing the Hoist

1. Always store the hoist in a no load condition.
2. Wipe off all dirt and water.
3. Oil the chain, hook pins and hook latch.
4. Place in a dry location.
5. Plug hoist air inlet port.
6. Before returning hoist to service, follow instructions for hoists not in regular service in the "INSPECTION" section.

ADJUSTMENT TROLLEY LCA015S/LCA030D

Pre-adjust trolley for installation using Dwg. D5230233 and the following instructions.

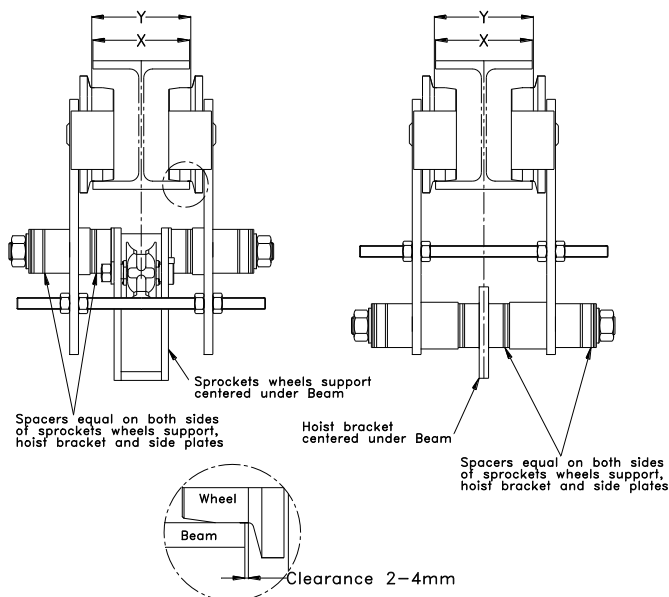
1. Fasten tightening nuts (74) to one end of suspension shaft (75), using springwashers (73), apply Loctite® 243 to capscrows threads.
2. Measure beam flange width and establish required position for spacers. Install required outside spacers on suspension shaft (75).
3. Thread a nut (66) onto each end of the screw rod (67), as far to the center as possible.
4. Insert one end of this rod into the side plate and loosely fasten with another nut (66).
5. Insert suspension shaft through side plate (36).
6. Install an equal number of spacers to each side of hoist support (35), and sprockets wheels support (58), on suspension shaft.

NOTICE

- The total clearance between the beam and the trolley wheel flanges is 4 to 8 mm when trolley is installed correctly. As shown in Dwg. D5230233, the difference between dimensions "X" and "Y" equals the total clearance.

7. Support the assembled portion of trolley on the beam.
8. Install second side plate (37).
9. Place the rest of spacers on the suspension shaft and secure loosely with nuts and springwashers.
10. Verify trolley wheel to beam total clearance. Adjust spacer locations until clearance specification is attained (refer to Dwg. D5230233). Apply Loctite® 243 to nuts and secure in place.

11. Screw inner nuts (66) out until they contact with side plates. Thread outside nuts (66) onto screw or until tight against side plates. Check that side plates are perpendicular to beam.
12. Upon completion of installation, ensure trolley beam stops are installed and conduct initial operating checks as described in "OPERATION" section. Check that side plates are vertical and parallel to each other.



(Dwg.D5230233)

ADJUSTMENT TROLLEY LCA030S/LCA060D/LCA70D

WARNING

- Before installing read "SAFETY INFORMATION",
- Make sure trolley wheels are compatible with the beam. Tapered wheels are for use only with "I" beams (IPN) ; flat tread wheels are for use only with "H" type beams (IPE).

NOTICE

- Trolley wheels ride on the top of the lower flange of the beam.
- During assembly lubricate gears, nuts, capscrews, and all machined threads with applicable lubricants. Use of antiseize compound and/or thread lubricant on capscrow and nut threaded areas prevents corrosion.

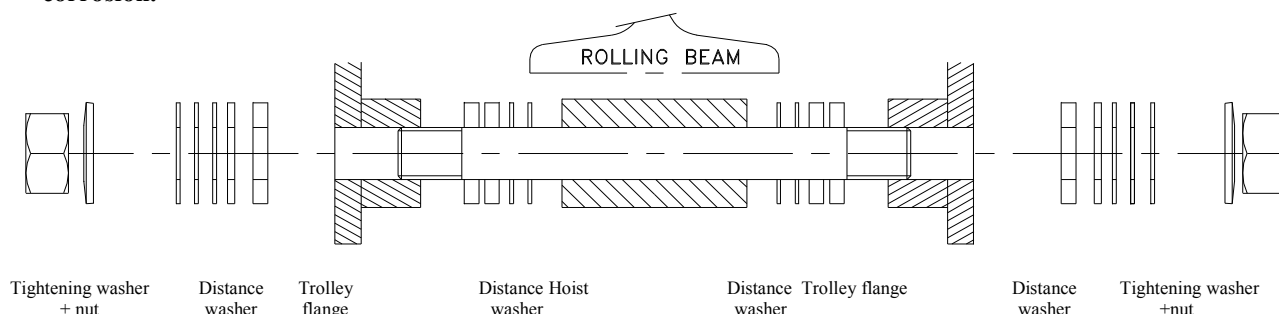
Adjustment Trolley

Refer.Dwg.D5230459

According to travelling beam used

The adjustment is realized with the distance washer :
2.5-3-3,5-4-5-15-25 and 42.5 mm thick
(Rep. 23-26-27-28-35-36-43-52).

1. Stack un the washers as notified on the following sheet.
2. Position the tightening washers Rep. 31.
3. Tighten the nuts Rep. 51 at 55 mdaN.



Rolling beam	Additional thickness of distance washer	Thickness of distance washer	Thickness of distance washer to make use adjustment	Additional thickness of distance washer to make use adjustment
IPN 220-98	42.5+25+15+5+4+3.5+3+3+2.5+2.5	0	0	2.5+2.5+3+3+3.5+4+5+15+25+42.5
IPN 240-106	42.5+25+15+5+3.5+3+3+2.5+2.5	4	4	2.5+2.5+3+3+3.5+5+15+25+42.5
IPN 260-113	42.5+25+15+4+3.5+3+3+2.5	2.5+5	5+2.5	2.5+3+3+3.5+4+15+25+42.5
IPN 280-119	42.5+25+15+4+3.5+3+2.5	2.5+3+5	5+3+2.5	2.5+3+3.5+4+15+25+42.5
IPN 300-125	42.5+25+15+4+3+3	2.5+2.5+3.5+5	5+3.5+2.5+2.5	3+3+4+15+25+42.5
IPN 320-131	42.5+25+15+4+3	2.5+2.5+3+3.5+5	5+3.5+3+2.5+2.5	3+4+15+25+42.5
IPN 340-137	42.5+25+15+4	2.5+2.5+3+3+3.5+5	5+3.5+3+3+2.5+2.5	4+15+25+42.5
IPN 360-143	42.5+25+4+3.5+3+3+2.5	2.5+5+15	15+5+2.5	2.5+3.5+4+25+42.5
IPN 400-155	42.5+25+4+3.5+2.5	2.5+3+3+5+15	15+5+3+3+2.5	2.5+3+3+3.5+4+25+42.5
IPN 450-170	42.5+15+4+3+3+2.5	2.5+3.5+5+25	25+5+3.5+2.5	2.5+3+3+4+15+42.5
IPN 500-185	42.5+5+4+3+3+2.5+2.5	3.5+15+25	25+15+3.5	2.5+2.5+3+3+4+5+42.5
IPN 550-200	25+15+4+3+3+2.5+2.5	3.5+5+42.5	42.5+5+3.5	2.5+2.5+3+3+4+15+25
IPN 600-215	25+15+4+3.5	2.5+2.5+3+3+5+42.5	42.5+5+3+3+2.5+2.5	3.5+4+15+25
IPE 220-110	42.5+25+15+5+4+3.5+2.5+2.5	3+3	3+3	2.5+2.5+3.5+4+5+15+25+42.5
IPE 240-120	42.5+25+15+4+3.5+2.5+2.5	3+3+5	5+3+3	2.5+2.5+3.5+4+15+25+42.5
IPE 270-135	42.5+25+5+4+3+3+2.5+2.5	3.5+15	15+3.5	2.5+2.5+3+3+4+5+15+25+42.5
IPE 300-150	42.5+25+4+3.5+2.5+2.5	3+3+5+15	15+5+3+3	2.5+2.5+3.5+4+25+42.5
IPE 330-160	42.5+15+5+4+3.5+2.5+2.5	3+3+25	25+3+3	2.5+2.5+3.5+4+5+15+42.5
IPE 360-170	42.5+15+4+3.5+2.5+2.5	3+3+5+25	25+5+3+3	2.5+2.5+3.5+4+15+42.5
IPE 400-180	42.5+15+4+3.5	2.5+2.5+3+3+5+25	25+5+3+3+2.5+2.5	3.5+4+15+42.5
IPE 450-190	25+15+5+4+3+3+2.5+2.5	3.5+42.5	42.5+3.5	2.5+2.5+3+3+4+5+15+25
IPE 500-200	25+15+4+3+3+2.5+2.5	3.5+5+42.5	42.5+5+3.5	2.5+2.5+3+3+4+15+25
IPE 535-210	25+15+4+3+3	2.5+2.5+3.5+5+42.5	42.5+5+3.5+2.5+2.5	3+3+4+15+25
IPE 600-220	25+5+4+3+3+2.5+2.5	3.5+15+42.5	42.5+15+3.5	2.5+2.5+3+3+4+5+25
HE 206	25+15+4+3+2.5+2.5	3+3.5+5+42.5	42.5+5+3.5+3	2.5+2.5+3+3+4+15+25
HE 220	25+5+4+3+3+2.5+2.5	3.5+15+42.5	42.5+15+3.5	2.5+2.5+3+3+4+5+25
HE 226	25+5+4+3+2.5+2.5	3+3.5+15+42.5	42.5+15+3.5+3	2.5+2.5+3+3+4+5+25
HE 240	15+5+4+3+3+2.5+2.5	3.5+25+42.5	42.5+25+3.5	2.5+2.5+3+3+4+5+15
HE 248	15+4+3.5+3+3+2.5	2.5+5+25+42.5	42.5+25+5+2.5	2.5+3+3+3.5+4+15
HE 260	15+4+3.5+2.5	2.5+3+3+5+25+42.5	42.5+25+5+3+3+2.5	2.5+3.5+4+15
HE 268	5+4+3.5+3+3+2.5	2.5+15+25+42.5	42.5+25+15+2.5	2.5+3+3+3.5+4+5
HE 280	4+3+3+2.5+2.5	3.5+5+15+25+42.5	42.5+25+15+5+3.5	2.5+2.5+3+3+4
HE 288	3+3+2.5+2.5	3.5+4+5+15+25+42.5	42.5+25+15+5+4+3.5	2.5+2.5+3+3
HE 290	5+2.5+2.5	3+3+3.5+4+15+25+42.5	42.5+25+15+4+3.5+3+3	2.5+2.5+5
HE 300	2.5+2.5	3+3+4+5+15+25+42.5	42.5+25+15+5+4+3.5+3+3	2.5+2.5
HE 305	2.5	2.5+3+3+3.5+4+5+15+25+42.5	42.5+25+15+5+4+3.5+3+3+2.5	2.5
HE 310	0	2.5+2.5+3+3+3.5+4+5+15+25+42.5	42.5+25+15+5+4+3.5+3+3+2.5+2.5	0

ADJUSTMENT TROLLEY LCA060S TO 250Q « LR »

WARNING

- Before installing read "SAFETY INFORMATION",
- Make sure trolley wheels are compatible with the beam. Tapered wheels are for use only with "I" beams (IPN) ; flat tread wheels are for use only with "H" type beams (IPE).

NOTICE

- Trolley wheels ride on the top of the lower flange of the beam.
- During assembly lubricate gears, nuts, capscrews, and all machined threads with applicable lubricants. Use of antiseize compound and/or thread lubricant on capscrow and nut threaded areas prevents corrosion.

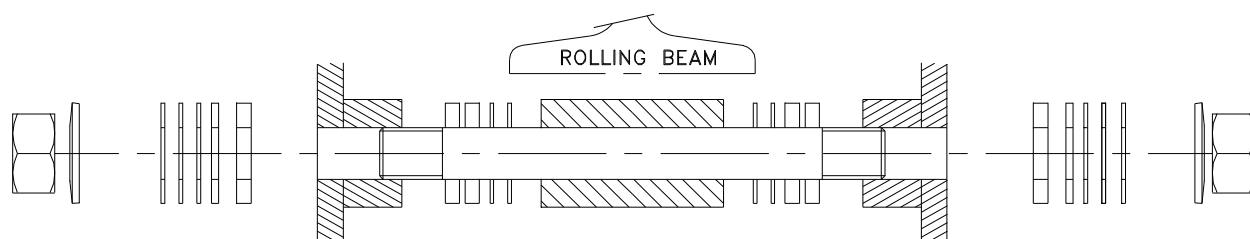
Adjustment Trolley

Refer.Dwg.D5440207

According to travelling beam used

The adjustment is realized with the distance washer :
2.5-3-3.5 - 5 - 6 - 10 - 15 and 35 mm thick
(Rep. 23-26-27-28-35-36-43-52).

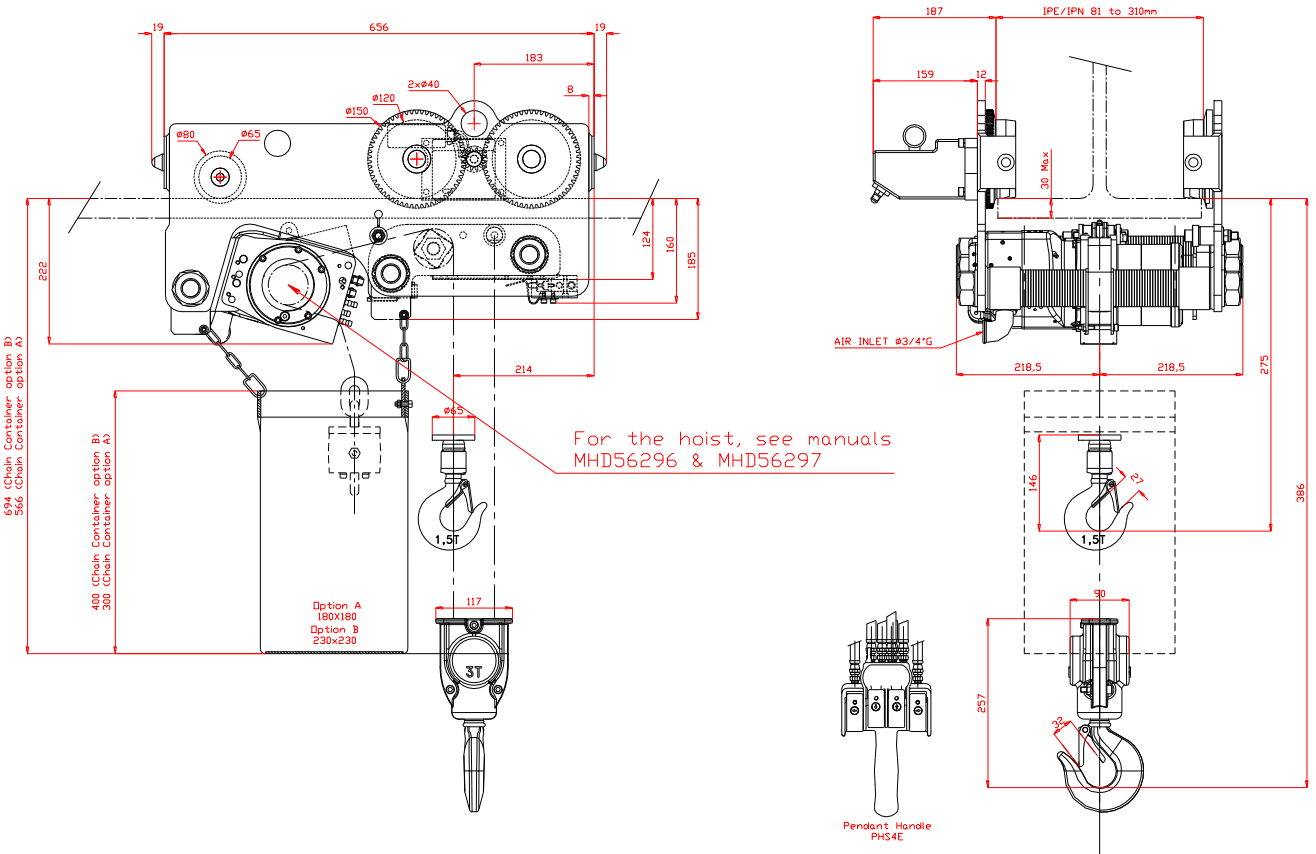
1. Stack un the washers as notified on the following sheet.
2. Position the tightening washers Rep. 31.
3. Tighten the nuts Rep. 51 at 110 mdaN.



Tightening washer + nut Distance washer Trolley flange Distance washer Hoist Distance washer Trolley flange Distance washer Tightening washer + nut

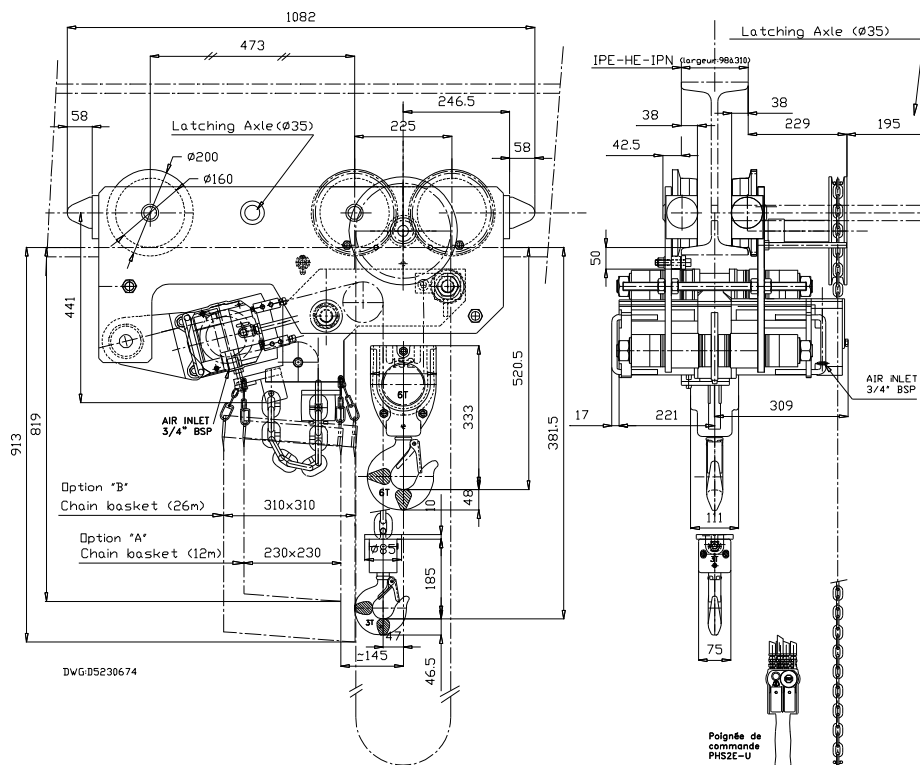
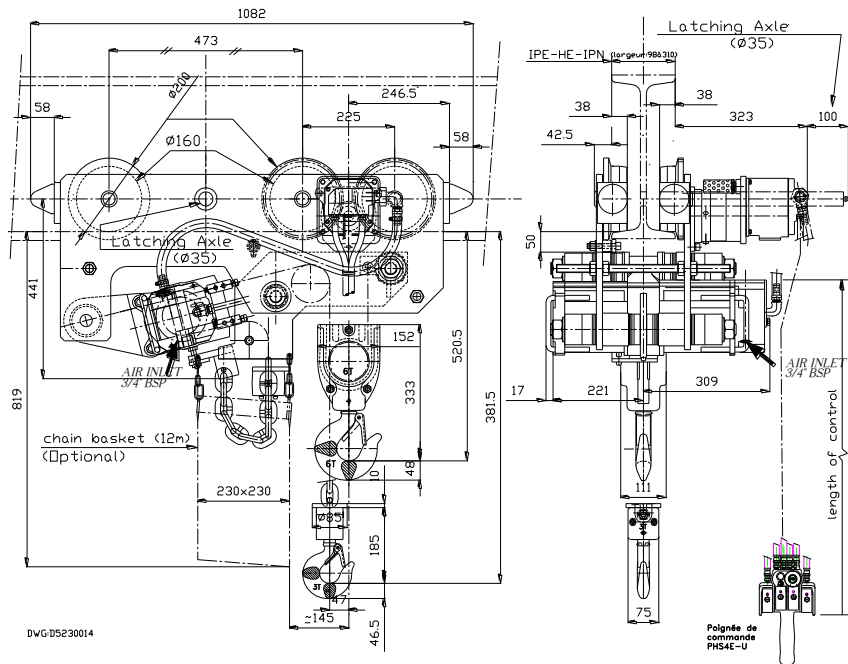
Rolling beam	Additional thickness of distance washer	Thickness of distance washer	Thickness of distance washer to make use adjustment	Additional thickness of distance washer to make use adjustment
IPN 360-143	35+15+10+6+5+3.5+3.5+3+2.5	0	0	2.5+3+3.5+5+6+10+15+35
IPN 400-155	35+15+10+5+3.5+3.5+3+2.5	6	6	2.5+3+3.5+3.5+5+10+15+35
IPN 450-170	35+15+10+3.5+3.5+3	2.5+5+6	6+5+2.5	3+3.5+3.5+10+15+35
IPN 500-180	35+10+5+3.5+3.5+3+2.5	6+15	15+6	2.5+3+3.5+3.5+5+10+35
IPN 550-200	35+6+5+3.5+3+2.5	3.5+10+15	15+10+3.5	2.5+3+3.5+5+6+35
IPN 600-215	35+3.5+3.5+3+2.5	5+6+10+15	15+10+6+5	2.5+3+3.5+3.5+35
IPE 300-150	35+15+10+6+5+3.5+3+2.5	3.5	3.5	2.5+3+3.5+5+6+10+15+35
IPE 330-160	35+15+10+6+3.5+3+2.5	3.5+5	5+3.5	2.5+3+3.5+6+10+15+35
IPE 360-170	35+15+10+3.5+3.5+3	2.5+5+6	6+5+2.5	3+3.5+3.5+10+15+35
IPE 400-180	35+10+6+5+3.5+3+2.5	3.5+15	15+3.5	2.5+3+3.5+5+6+10+35
IPE 450-190	35+10+6+3.5+3+2.5	3.5+5+15	15+5+3.5	2.5+3+3.5+6+10+35
IPE 500-200	35+6+5+3.5+3+2.5	3.5+10+15	15+10+3.5	2.5+3+3.5+5+6+35
IPE 535-210	35+5+3.5+3.5+3	2.5+6+10+15	15+10+6+2.5	3+3.5+3.5+5+35
IPE 600-220	15+10+6+5+3.5+3+2.5	3.5+35	25+3.5	2.5+3+3.5+5+6+10+15
HE 240	15+6+5+3.5+3+2.5	3.5+10+35	35+10+3.5	2.5+3+3.5+5+6+15
HE 248	15+6+3.5+3.5+3	2.5+5+10+35	35+10+5+2.5	3+3.5+3.5+6+15
HE 260	15+3.5+3.5+3	2.5+5+6+10+35	35+10+6+5+2.5	3+3.5+3.5+15
HE 268	6+5+3.5+3.5+3	2.5+10+15+35	35+15+10+2.5	3+3.5+3.5+5+6
HE 280	6+3.5+3+2.5	3.5+5+10+15+35	35+15+10+5+3.5	2.5+3+3.5+6
HE 288	6+5	2.5+3+3.5+3.5+10+15+35	35+15+10+3.5+3.5+3+2.5	5+6
HE 290	3.5+3.5+3	2.5+5+6+10+15+35	35+15+10+6+5+2.5	3+3.5+3.5
HE 300	5	2.5+3+3.5+3.5+6+10+15+35	35+15+10+6+3.5+3.5+2.5	5
HE 305	2.5	3+3.5+3.5+5+6+10+15+35	35+15+10+6+5+3.5+3.5+3	2.5
HE 310	0	2.5+3+3.5+3.5+5+6+10+15+35	35+15+10+6+5+3.5+3.5+3+2.5	0

SPECIFICATIONS LC2A015S/030D



		LC2A015SIP...	LC2A030DIP...
Working Pressure		6.3 Bar	6.3 Bar
Speed at no Load (m/min.)	Lifting	0<V< 8.4	0<V< 4.2
	Lowering	0<V< 5.4	0<V< 2.7
	Traverse	0<V< 27	0<V< 27
Speed at Rated Load (m/min.)	Lifting	0<V< 5.4	0<V< 2.7
	Lowering	0<V< 7.2	0<V< 2.6
	Traverse	0<V< 17	0<V< 17
Air Consumption (m3/min.)	Hoist only	0 ÷ 3.8	0 ÷ 3.8
	Trolley only	0 ÷ 1.3	0 ÷ 1.3

SPECIFICATIONS LCA030S/060D

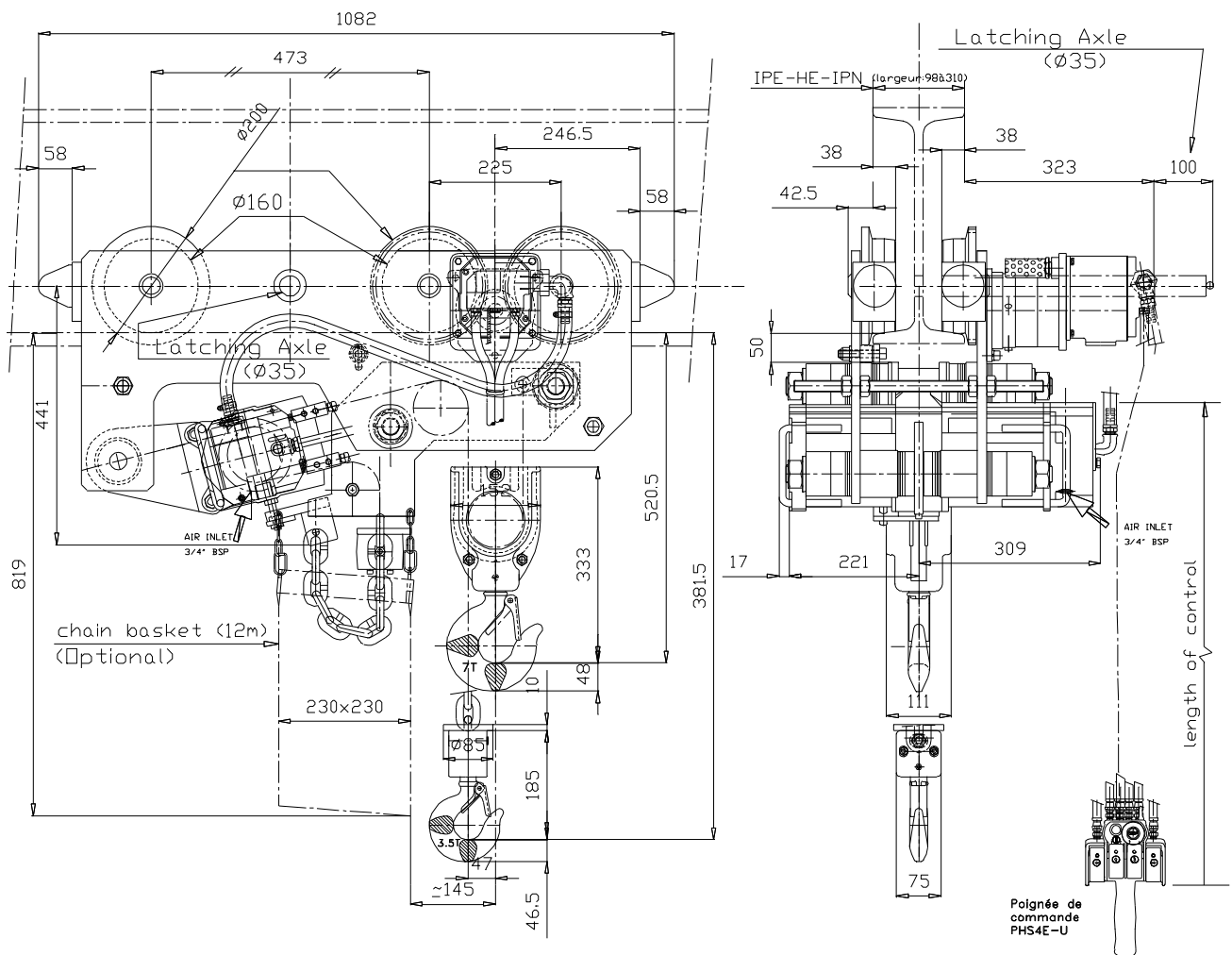


Rayon de courbure env.:30m

Vitesse de: Speed of : (m/mn)	à 4 bars				à 6 bars			
	à vide no load		en charge full load		à vide no load		en charge full load	
	croch.3T	mouf.6T	croch.3T	mouf.6T	croch.3T	mouf.6T	croch.3T	mouf.6T
Translation Trolley	0 à 13		0 à 9		1.3		0 à 16	
Levée Lifting	0 à 4	0 à 2	0 à 2.2	0 à 1.1	2		0 à 6	0 à 3.2
Descente Lowering	0 à 2.2	0 à 1	0 à 4	0 à 2	2		0 à 3.2	0 à 1.6

* Not applicable for LCA---2LGU

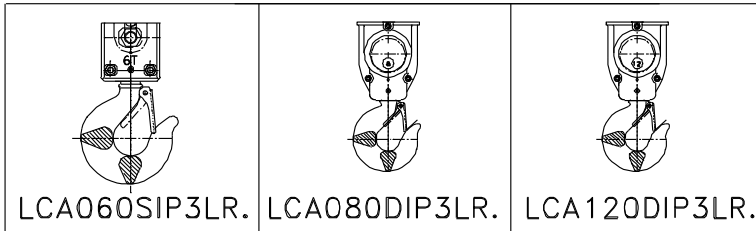
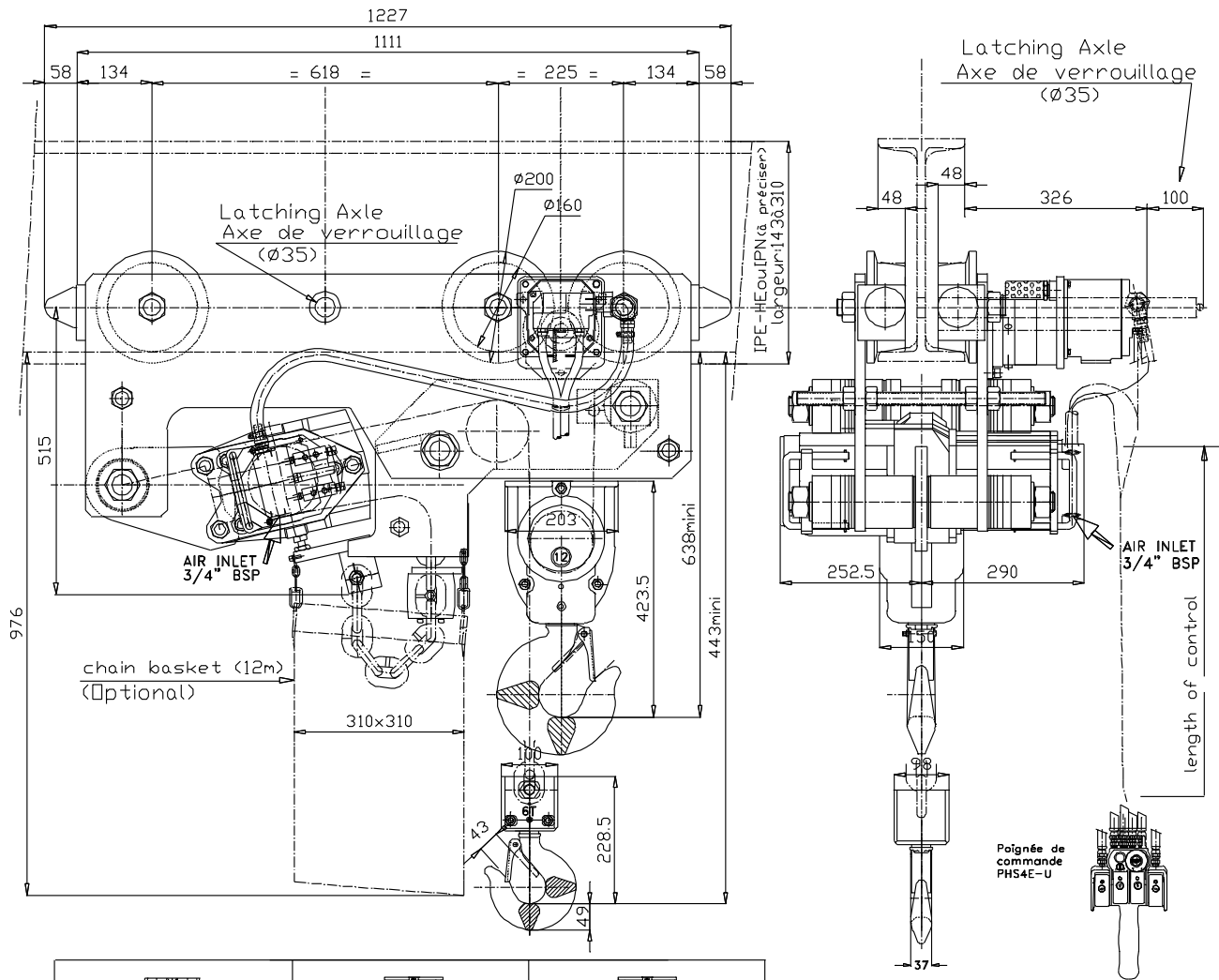
SPECIFICATIONS LCA070D



Rayon de courbure env.:30m

Vitesse de: Speed of : (m/mn)	à 6 bars				consom.d'air Air consump. (Nm3/mn)
	à vide no load		en charge full load		
	crochet 3.5T	moufle 7T	crochet 3.5T	moufle 7T	
Translation Trolley	0 à 16		0 à 12		1.9
Levée Lifting	0 à 6	0 à 3	0 à 2.4	0 à 1.2	3.4
Descente Lowering	0 à 3.2	0 à 1.6	0 à 6.4	0 à 3.2	3.4

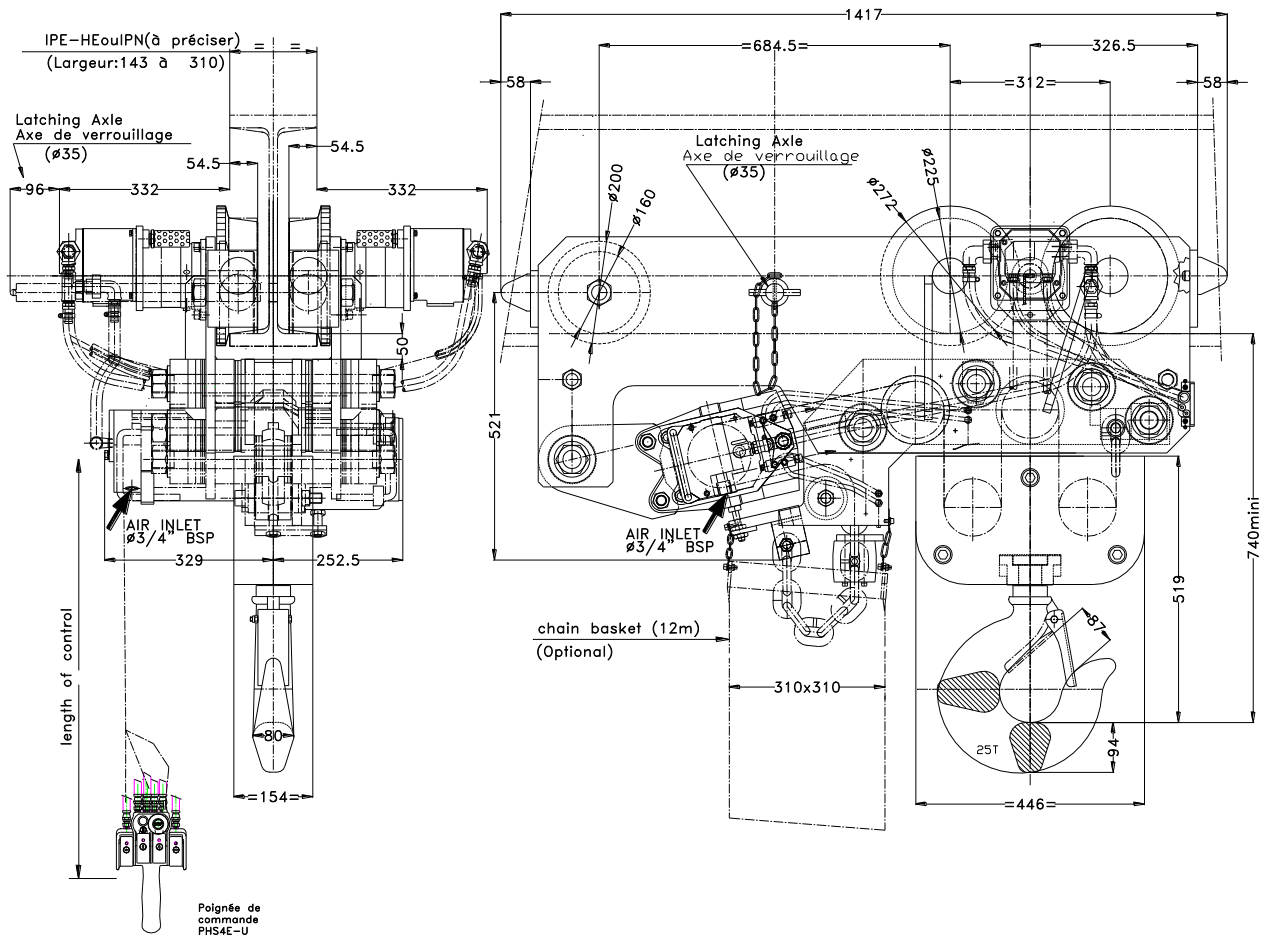
SPECIFICATIONS LCA060S/080D/120D



Weight: 470 Kg

Vitesse de: Speed of : (m/mn)	4 bars					6 bars						
	à vide no load		en charge full load		consom.d'air Air consump. (Nm3/mn)	à vide no load			en charge full load			consom.d'air Air consump. (Nm3/mn)
	croch.6T	mouf.12T	croch.6T	mouf.12T		croch.6T	mouf.12T	mouf.8T	croch.6T	mouf.12T	mouf.8T	
Translation Trolley	0 à 13		0 à 9		1.3	0 à 16			0 à 12			1.9
Levée Lifting	0 à 2.6	0 à 1.3	0 à 1	0 à 0.5	2	0 à 3.2	0 à 1.6		0 à 1.5	0 à 0.75	0 à 1	3.4
Descente Lowering	0 à 2	0 à 1	0 à 3	0 à 1.5	2	0 à 1.6	0 à 0.8		0 à 3	0 à 1.5	0 à 1.1	3.4

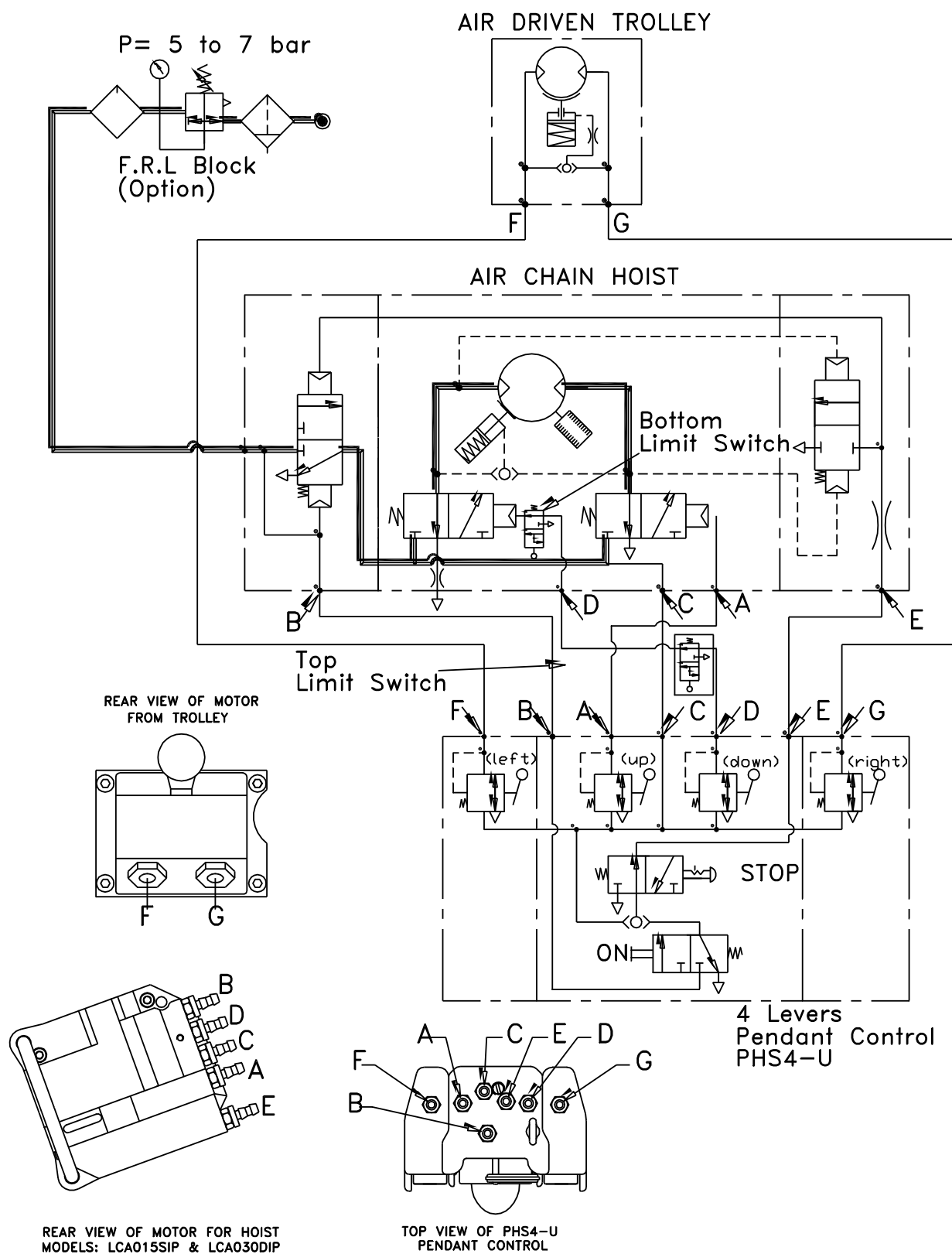
SPECIFICATIONS LCA250Q



Poids env.: 840kg
Weight : 840kg

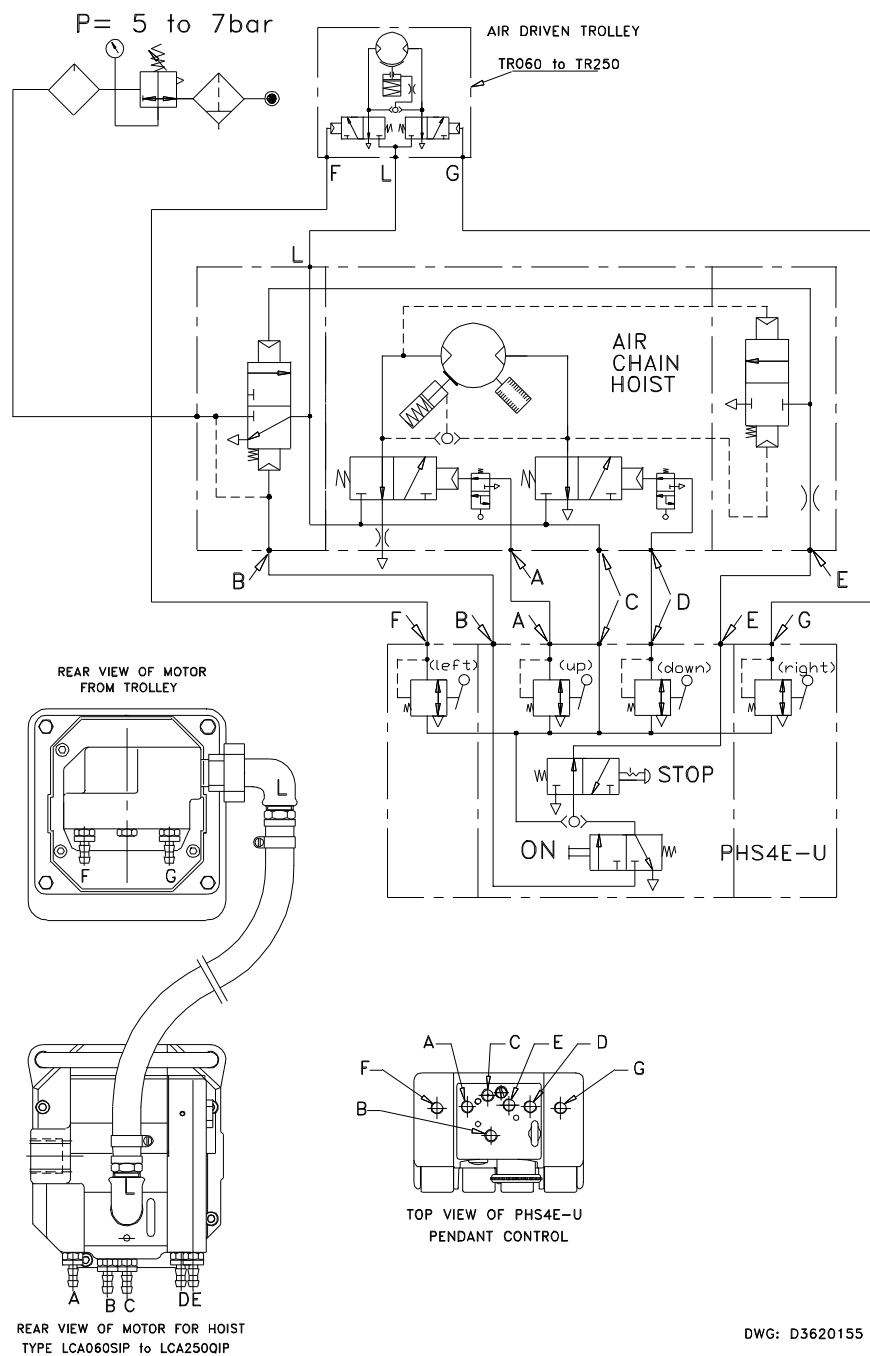
Vitesse de: Speed of : (m/mn)	à 4 bars			à 6 bars		
	à vide no load	en charge full load	consom.d'air Air consump. (Nm ³ /mn)	à vide no load	en charge full load	consom.d'air Air consump. (Nm ³ /mn)
Translation Trolley	0 à 12	0 à 9	2.6	0 à 15	0 à 12	3.8
Levée Lifting	0 à 0.6	0 à 0.26	2	0 à 0.75	0 à 0.4	3.4
Descente Lowering		0 à 0.8	2		0 à 0.8	3.4

PNEUMATIC SCHEME (LC2A015S/LC2A030D)



D6440776

PNEUMATIC SCHEME (LCA030S TO LCA250Q)



DWG: D3620155

OPERATION

The four most important aspects of hoist operation are:

1. Follow all safety instructions when operating the hoist.
2. Allow only people trained in safety and operation of this product to operate the hoist.
3. Subject each hoist to a regular inspection and maintenance program.
4. Be aware of the hoist capacity and weight of load at all times.

Operators must be physically competent. Operators must have no health condition which might affect their ability to act, and they must have good hearing, vision and depth perception. The hoist operator must be carefully instructed in his or her duties and must understand the operation of the hoist, including a study of the manufacturer's literature. The operator must thoroughly understand proper methods of hitching loads and should have a good attitude regarding safety. It is the operator's responsibility to refuse to operate the hoist under unsafe conditions.

Initial Operating Checks

Hoists are tested for proper operation prior to leaving the factory. Before the hoist is placed in service the following initial operating checks should be performed.

1. After installation of trolley mounted hoists, check to ensure the hoist is centered below the trolley.
2. Check for air leaks in the supply hose and fittings to pendant, as well as from pendant to manifold.
3. When first running the hoist or trolley motors, some light oil should be injected into the inlet connection to allow good lubrication.
4. When first operating the hoist and trolley it is recommended that the motors be driven slowly in both directions for a few minutes.
5. Operate the trolley along the entire length of the beam.
6. Inspect hoist and trolley performance when raising, moving and lowering test loads. Hoist and trolley must operate smoothly and at rated specifications prior to being placed in service.
7. Check that trolley and hook movement is in the same direction as arrows and pendant control labels.
8. Raise and lower a light load to check operation of the hoist brake.
9. Check hoist operation by raising and lowering a load equal to the rated capacity of the hoist a few inches (cm) off the floor.
10. Check operation of limit devices.
11. Check to see that the hoist is directly over the load. Do not lift the load at an angle ("side pull" or "yard").
12. Check to see the hoist is securely connected to the overhead crane, monorail, trolley or supporting member.
13. Check to see that the load is securely inserted in the hook, and that the hook latch is engaged.

WARNING

- Allow only personnel trained in safety and operation of this product to operate hoist and trolley.
- The hoist is not designed and not suitable for lifting, lowering or moving people. Never lift loads over people.

WARNING

- The hook latch is intended to retain loose slings or devices under slack conditions. Hook latches are not intended to be anti-fouling devices, so caution must be used to prevent the latch from supporting any of the load.

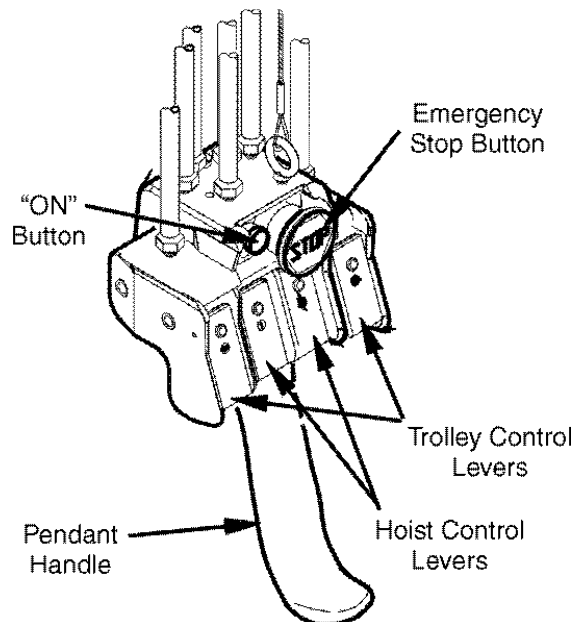
Pendant

The pendant is a remote control that allows the operator to control the positioning of a load. It will allow the operator to control hoist movements from a distance, thereby allowing exact positioning of a hook.. The four lever pendant controls both hook and trolley positions.

Emergency Stop

The Emergency Stop button, when activated, will immediately stop all operations of the hoist and trolley. The Emergency Stop button will remain depressed after activation.

To reset four lever pendants Emergency Stop button twist (rotate) Emergency Stop button clockwise until button releases and spring returns to its original position. Depress "ON" button.



(Dwg.MHP1547)

INSPECTION

WARNING

- All new, altered or modified equipment should be inspected and tested by personnel instructed in safety, operation and maintenance of this equipment to ensure safe operation at rated specifications before placing equipment in service.
- Never use a hoist that inspection indicates is damaged.

Frequent and periodic inspections should be performed on equipment in regular service. Frequent inspections are visual examinations performed by operators or personnel trained in safety and operation of this equipment and include observations made during routine hoist operation. Periodic inspections are thorough inspections conducted by personnel trained in the safety, operation and maintenance of this equipment.

The states inspection intervals depend upon the nature of the critical components of the equipment and the severity of usage. The inspection intervals recommended in this manual are based on intermittent operation of the hoist eight hours each day, five days per week, in an environment relatively free of dust, moisture and corrosive fumes. If the hoist is operated almost continuously or more than the eight hours each day, more frequent inspections will be required. Careful inspection on a regular basis will reveal potentially dangerous conditions while still in the early stages, allowing corrective action to be taken before the condition becomes dangerous.

Deficiencies revealed through inspection, or noted during operation, must be reported to designated personnel instructed in safety, operation and maintenance of this equipment. A determination as to whether a condition constitutes a safety hazard must be made, and the correction of noted safety hazards accomplished and documented by written report before placing the equipment in service.

Records and Reports

Inspection records, listing all points requiring periodic inspection should be maintained for all load bearing equipment.

Written reports, based on severity of service, should be made on the condition of critical parts as a method of documenting **periodic** inspections. These reports should be dated, signed by the person who performed the inspection, and kept on file where they are readily available for review.

Load Chain Reports

Records should be maintained documenting the condition of load chain removed from service as part of a long-range load chain inspection program. Accurate records will establish a relationship between visual observations noted during frequent inspections and the actual condition of the load chain as determined by periodic inspection methods.

Frequent Inspection

On hoists in continuous service, frequent inspections should be made by operators at the beginning of each shift. In addition, visual inspections should be conducted during regular service for any damage or evidence of malfunction.

1. OPERATION. Check for visual signs or abnormal noises (grinding, etc.) which could indicate a potential problem. Make sure all controls function properly and return to neutral when released. Check chain feed through the hoist and bottom block. If chain binds, jumps, is excessively noisy or "clicks," clean and lubricate the chain. If the problem persists, replace the chain. Do not operate the hoist until all problems have been corrected.
2. UPPER AND LOWER LIMIT DEVICE. Test operation with no load slowly in both extremes of travel. Upward travel must stop when the stop buffer on the bottom block hits hoist limit switch. Downward travel must stop when the stop buffer attached to the end of the unloaded load chain decreases and activates the limit switch.
3. HOOKS. Check for wear or damage, increased throat width, bent shank or twisting of hook. Replace hooks which exceed the throat opening discard width or which exceed a 10° twist. If the hook latch snaps past the tip of the hook, the hook is sprung and must be replaced. Check hook support bearings for lubrication or damage. Ensure that they swivel easily and smoothly.
4. HOOK LATCH. Make sure hook latch is present and operating. Replace if necessary.

CAUTION

- Do not use hoist if hook latch is missing or damaged.

5. CONTROLS. During operation of the hoist, verify that response to pendant is quick and smooth. See that the controls return to neutral when released. If hoist responds slowly or movement is unsatisfactory, do not operate the hoist until all problems have been corrected.
6. AIR SYSTEM. Visually inspect all connections, fittings, hoses and components for indication of air leaks. Repair any air leaks found. Check and clean the filter.
7. LOAD CHAIN. Examine each of the links for bending, cracks in weld areas or shoulders, traverse nicks and gouges, weld splatter, corrosion pits, striation (minute parallel lines) and chain wear, including bearing surfaces between chain links. Replace a chain that fails any of the inspections. Check chain lubrication and lubricate if necessary. Refer to "Load Chain" in the "LUBRICATION" section.

NOTICE

- The full extent of load chain wear cannot be determined by visual inspection. At any indication of load chain wear, inspect the chain and chain wheel in accordance with instructions in "Periodic Inspection."

8. LOAD CHAIN REEVING. Ensure welds on standing links are away from load sheave. Reinstall chain if necessary. Make sure chain is not capsized, twisted or kinked.

Periodic Inspection

frequency of periodic inspection depends on severity of usage:

NORMAL	HEAVY	SEVERE
yearly	semiannually	quarterly

Disassembly may be required for HEAVY or SEVERE usage. Keep accumulative written records of periodic inspections to provide a basis for continuing evaluation. Inspect all the items in "Frequent Inspection." Also inspect the following:

1. **FASTENERS.** Check all rivets, split pins, capscrews and nuts. Replace if missing or tighten if loose.
2. **ALL COMPONENTS.** Inspect for wear, damage, distortion, deformations and cleanliness. If external evidence indicates the need, disassemble. Check gears, shafts, bearings, sheaves, chain guides, springs and covers. Replace worn or damaged parts. Clean, lubricate and reassemble.
3. **HOOKS.** Inspect hooks carefully for cracks using magnetic particle or other suitable non-destructive method. Inspect hook retaining parts. Tighten or repair if necessary.
4. **LOAD CHAIN SPROCKET.** Check for damage or excessivewear. Replace if necessary. Observe the action of the load chain feeding through the hoist. Do not operate a hoist unless the load chain feeds through the hoist and hook block smoothly and without audible clicking or other evidence of binding or malfunctioning.
5. **MOTOR.** If performance is poor, disassemble the motor and check for wear or damage to bearings and shafts. The parts should be cleaned, lubricated and reassembled. Replace worn or damaged parts.
6. **BRAKE.** Raise a load equal to the rated capacity of the hoist a few inches (cms) off the floor. Verify hoist holds the load without drift. If drift occurs, disassemble. Remove the brake discs as described in the "MAINTENANCE" section. Check and clean the brake parts each time the hoist is disassembled. Replace the brake discs if the grooves are no longer visible.
7. **SUPPORTING STRUCTURE.** Check for distortion, wear and continued ability to support a load.
8. **TROLLEY (if equipped).** Check that the trolley wheels track the beam properly and trolley is correctly adjusted in accordance with manufacturer's literature. Check that wheels and beam are not excessively worn and inspect side plates for spreading due to bending. Do not operate the hoist until the problem has been determined and corrected.
9. **LABELS AND TAGS.** Check for presence and legibility. Replace if necessary.
10. **LOAD CHAIN END ANCHORS.** Ensure both ends of the load chain are securely attached. Secure if loose, repair if damaged, replace if missing. Check chain stoppers are correctly installed and functional.

11. **LOAD CHAIN.** Measure the chain for stretching. Measure the load chain over the outside of five link sections all along the the chain, paying particular attention to the most frequently reeved links. When any five links in the working length reaches or exceeds the discard length, replace the entire chain. Always use genuine **Ingersoll-Rand** Material Handling replacement chain. Zinc plated load chain is standard on Liftchain hoists.

LC2A015S / LC2A030D :
Chain size 8x24 G8 (69089432)
Normal Length: 120 mm
Discard Length: 122 mm

LCA030S / LCA060D :
Chain size 13x36 G6 (69087432)
Normal Length: 180 mm
Discard Length: 183 mm

LCA035S / LCA070D :
Chain size 13x36 G8 (69054232)
Normal Length: 180 mm
Discard Length: 183 mm

LCA060S to LCA250Q :
Chain size 16 x 45 G8 (69087532)
Normal Length: 225 mm
Discard Length: 228 mm

12. **CHAIN CONTAINER.** Check for damage or excessive wear and that chain container is securely attached to the hoist. Secure or replace if necessary.
13. **LIMIT SWITCH.** Check limit switches function correctly.

Hoists Not in Regular Use

1. A hoist which has been idle for a period of one month or more, but less than one year, should be given an inspection conforming to the requirements of "Frequent Inspection" prior to being placed in service.
2. A hoist which has been idle for a period of more than one year should be given an inspection conforming to the requirements of "Periodic Inspection" prior to being placed in service.
3. Standby hoists should be inspected at least semiannually in accordance with the requirements of "Frequent Inspection." In abnormal operating conditions, hoists should be inspected at shorter intervals.

LUBRICATION

To ensure continued satisfactory operation of the hoist, all points requiring lubrication must be serviced with the correct lubricant at the proper time intervals indicated for each assembly. Correct lubrication is one of the most important factors in maintaining efficient operation. The lubrication intervals recommended in Table 6 are based on intermittent operation of the hoist eight hours each day, five days per week. If the hoist is operated almost continuously, or for more than eight hours each day, or under severe conditions, more frequent lubrication will be required.

Table 6

Component	LUBRICATION Frequency by usage level		
	Severe	Heavy	Normal
Load chain	Daily	Weekly	At usage
Hook	Daily	Weekly	At usage
Gear case	Yearly	Every 3 years	Unnecessary

Lubricant types and change intervals are based on operation in an environment relatively free of dust, moisture and corrosive fumes. Use only those lubricants recommended. Other lubricants may affect performance of the hoist. Approval for the use of other lubricants must be obtained from your **Ingersoll-Rand** Technical Support Department or distributor. Failure to observe this precaution may result in damage to the hoist and/or its associated components. Whenever a hoist is disassembled for overhaul or replacement of parts, lubricate as follows:

Brake and Gear Assemblies

The gear and brake assemblies share a common oil bath. On larger capacity hoists, the output shaft from the motor is offset and utilizes a pinion gear to drive the sun gear. These gears operate in the motor casing oil bath.

Model	Gear Casing (ml)	Motor Casing (ml)
LC2A015S and LC2A030D	150	N/A
LCA030S LCA060D and LCA070D	400	150
LCA060S to LCA250Q	750	150

LCA030S and Larger Hoists Oil Fill Level Positions

Fill to the level of the plug on the side of the motor housing and on the gear end in the center of the brake end cover.

Replace the oil in the brake and gear housing in accordance with Table 6 recommendations. Refer to Table 8 for recommended oil type. If hoist use is at normal frequency, the oil in the reduction housing is suitable for one year's operation without changing.

However, when hoist use is at greater frequency, or under severe conditions, the oil may need to be changed more often. To ensure correct performance, highest efficiency and long life, it is essential that the lubricating oil be maintained at the correct level. The recommended grade of

oil must be used at all times since the use of unsuitable oil may result in excessive temperature rise, loss of efficiency and possible damage to the gears.

Liftchain hoists are shipped from the factory with oil in the brake and reduction gear assembly.

Table 8

Ambient Temperature	Recommendes Oil Type
Below (0°C)	ISO VG22 (50W)
(0° to 26°C)	ISO VG 150 (90W)
Above (26°C)	ISO VG 460 (140W)

Hook Assemblies

Hoist top and bottom hooks are supported by thrust bearings. These bearings must be packed with **Ingersoll-Rand** No. 68 Grease or a standard No. 2 multi-purpose grease at regular intervals. Neglect of proper lubrication can lead to bearing failure.

1. Lubricate the hook and latch pivot points. Hook and latch should swivel/pivot freely.
2. Use **Ingersoll-Rand** LUBRI-LINK-GREEN ® or ISO VG 220 (50W) lubricant.
3. Lubricate hook bearings by applying several shots of grease from a grease gun to the grease fittings provided on the hook blocks.

Air Line Lubricator

If an air line lubricator is used, it should be replenished daily with ISO VG 100 (30W) lubricant (minimum viscosity 135 Cst at 104° F (40° C)).

Trolley

Grease the wheel bearings and wheel drive gear with **Ingersoll-Rand** No. 68 Grease or a standard No. 2 multi-purpose grease periodically. Refer to the manufacturer's literature for additional lubrication information.

Load Chain

WARNING

• Failure to maintain a clean and well-lubricated load chain will result in rapid load chain wear that can lead to chain failure which can cause severe injury, death or substantial property damage.

1. Lubricate each link of the load chain weekly. Apply new lubricant over existing layer.
2. In severe applications or corrosive environments, lubricate more frequently than normal.
3. Lubricate hook and hook latch pivot points with same lubricant used on the load chain.
4. If required, clean chain with acid free solvent to remove rust or abrasive dust buildup and lubricate the chain.
5. Use **Ingersoll-Rand** LUBRI-LINK-GREEN ® or ISO VG 220 (50W) oil.

MAINTENANCE

WARNING

- Never perform maintenance on the hoist while it is supporting a load.
- Before performing maintenance, tag controls:
DANGER - DO NOT OPERATE - EQUIPMENT BEING REPAIRED.
- Only allow personnel trained in operation and service of this hoist to perform maintenance.
- After performing any maintenance on the hoist dynamically test the hoist to 100% of its rated capacity, in accordance with ASME B30.16 standards, before returning hoist to service. Testing to more than 100% of rated capacity is required to set overload device and may be required to comply with standards and regulations set forth in areas outside the USA.
- Shut off air system and depressurize air lines before performing any maintenance.

Proper use, inspections and maintenance increase the life and usefulness of your **Ingersoll-Rand** equipment. During assembly, lubricate gears, bearings and shafts with applicable lubricants. Use of a thread locking compound and/or thread lubricant on capscrew and nut threaded areas helps prevent corrosion of components.

Maintenance Intervals

The Maintenance Interval Chart below is based on intermittent operation of equipment for eight hours each day, five days per week. If the equipment is in operation for more than eight hours a day or is operated in severe applications or environments, more frequent maintenance should be performed.

INTERVAL	MAINTENANCE CHECK
Start of each shift	Make a thorough visual inspection of the hoist for damage. Do not operate the hoist if damage is found.
	Operate in both directions. Hoist must operate smoothly without sticking, binding or abnormal noises.
	Check the operation of the brake.
Quarterly	Remove, clean or replace muffler in top of gear housing.
Yearly	Inspect the hoist gearing, shafts and bearings for damage or wear. Repair or replace as necessary.
	Check all of the supporting members, including the trolley if used. Repair or replace as required.

Adjustments

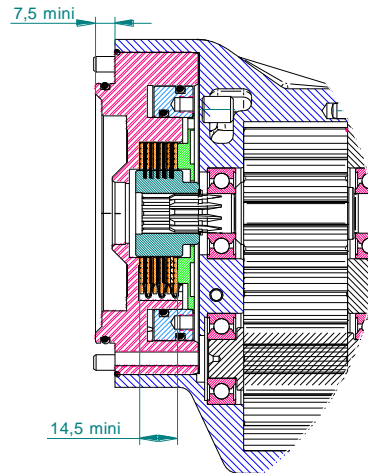
Brake

No brake adjustment is required.

Annual Maintenance is limited to:

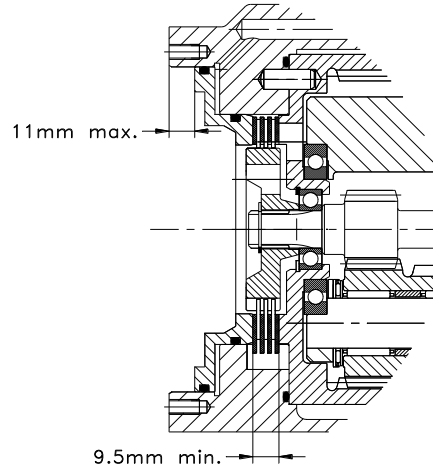
1. A general cleaning.
2. The friction discs have a 0.2 mm (0.079 in.) deep groove on each side. Replace the friction discs if the grooves are no longer visible. Refer to Dwg. D6440775 or D4120242.
3. Measure total brake and steel plate stack up. Check that measurement is not less than minimum shown.

LC2A015S and LC2A030D Hoists



(D6440775)

LCA030S TO LCA250Q Hoists



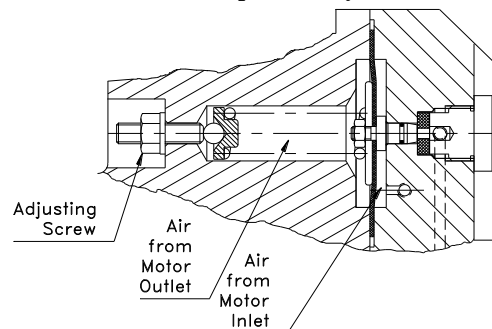
(Dwg. D4120242)

Overload Device

1. Connect the hoist to the air supply.
2. Release the locknut and turn the adjustment screw in order to increase or decrease the SWL (increase the SWL by tightening the adjustment screw). The adjustment must be made for an overload of 20% maximum of the SWL.
3. Tighten the locknut securing the adjustment screw.
4. Check hoist operation at rated load. If necessary repeat the adjustment.

NOTICE

- Do not change factory settings unless hoist is tested and recertified at an authorized repair facility.



(Dwg. D4120413)

Disassembly

WARNING

- **Disconnect the air supply hose before performing any maintenance or repairs on this hoist.**

General Instructions

All maintenance work done on the Liftchain hoist should be performed on a bench in a clean dust free work area. In the process of disassembling the hoist, observe the following:

1. Never disassemble the hoist any further than is necessary to accomplish the needed repair. A good part can be damaged during the course of disassembly.
2. Never use excessive force when removing parts. Tapping gently around the perimeter of a cover or housing with a soft hammer, for example, is sufficient to break the seal.
3. Do not heat a part with a flame to free it for removal, unless the part being heated is already worn or damaged beyond repair and no additional damage will occur to other parts. In general, the hoist is designed to permit easy disassembly and assembly. The use of heat or excessive force should not be required.
4. Keep the work area clean to prevent dirt and other foreign matter from getting into bearings and other moving parts.
5. All seals and 'O' rings should be discarded once they have been removed. New seals and 'O' rings should be used when assembling the hoist.
6. When grasping a part in a vise, always use leather- or copper-covered vise jaws to protect the surface of the part and help prevent distortion. This is particularly true of threaded members, machined surfaces and housings.
7. Do not remove any part which is press fit in or on a subassembly unless the removal of the part is necessary for repairs or replacement.
8. To avoid damaging bearings during hoist assembly or disassembly always tap or press on the bearing inner race for shaft fit bearings or the outer race for bore fit bearings.
9. For assembly work above body height, suitable working platforms or ladders should be made available.
10. Do not attempt to wash sealed bearings.

If hoists are to be completely disassembled it is recommended that the motor assembly and brake/gear housing assembly be removed as complete assemblies from the chain guide housing. This can be accomplished by removing the capscrews, nuts and washers that clamp the housings together. Carefully separate assemblies and clean mating surfaces. Assemblies are Loctited together.

The muffler is located in the top of the gear housing. To clean muffler remove retainer ring in gear housing and with the aid of small pick remove the first muffler plate. Remove 'O' ring, second muffler plate and last 'O' ring.

Load Chain Replacement

WARNING

- **NEVER splice a load chain except when installing a new load chain by the following method. Always discard the link used to connect the old chain with the new.**

Excessive chain wear cannot be detected by casual observation. The chain is case hardened and once the case hardening is worn through, wear will progress rapidly and the strength of the chain will be considerably reduced.

Further, the chain will no longer fit the chain sprocket properly, greatly increasing the chance of malfunction and chain breakage.

One chain sprocket will outlast several chains if the chain is replaced as recommended. The use of a worn chain will cause the chain sprocket to wear rapidly.

If the chain is visibly damaged, examine the chain sprocket and chain guide. Install a new chain sprocket if the old one is visibly worn. Install a new guide if the old one is broken or distorted.

NOTICE

- **For ease of installation, do not remove the old chain from the hoist. Use the old chain to feed the new chain through the hoist.**

1. The hoist must be hung and connected to the air supply. Reduce air pressure to 60 psi (4 bar).
2. Remove chain bucket, if used.
3. Remove free end of chain from hoist body, if attached. Remove chain buffer and limit stop.
4. Remove the load hook.
5. Run hoist slowly in the lifting direction until the chain free end is approximately 2 ft (60 cm) from the hoist.
6. Using an abrasive wheel, cut a section from the last link. Use a 'C' link which is the same size as the chain.

CAUTION

- **Do not distort the link in any manner. It must be able to pass over the pocket and idler wheels without binding.**

7. Connect the new chain to the old chain by hooking the end of the new chain onto the 'C' link. Make certain the welds and links on the new chain match the positioning of the welds and links on the chain being replaced.

CAUTION

- **Ensure that chain does NOT become twisted during reeving. All chain welds must align while chain is hanging free.**

8. Slowly run the hoist in the raise direction, running off the old chain and reeving the new chain over the chain wheel.

The first link of new chain over the chain wheel must be a standing link.

9. Reinstall the load hook, chain buffer and limit stop

WARNING

- **A twisted chain can jam as it passes over the pocket wheel, possibly resulting in damage to the hoist or even breaking the chain and causing injury.**

General Trolley Disassembly

NOTICE

• Prior to disassembly note the installation of the adjusting spacers. Install adjusting spacers during assembly, in the same configuration recorded during disassembly to ensure beam flange width and hoist position are retained.

• Prior to disassembly of trolley, first remove trolley motor, bottom hook ass'y, load chain and then remove hoist. For remove the hoist refer to LIFTCHAIN AIR HOIST Manual ref :SAM0208

Remove the trolley from the beam by removing end stop and after adequately supporting trolley, run trolley off the beam.

CAUTION

• Support trolley adequately as it comes off beam to prevent injury and/or damage to equipment. If that is not possible, loosen or remove only one side plate. Refer to "Side Plate Disassembly".

General Disassembly Hoist (LC2A015S/LC2A030D)

Dwg..D6440774

1. Remove the chain and the bottom hook.
2. Remove the chain basket
3. Disconnect all hoses

- Trolley Disassembly

1. Remove one nut (66) from outside of side plate.
No required for LCA015S and LCA030D
2. Remove nuts (28) and, washers (30) from same side plate. Separate side plate until it is free of beam.
Remove trolley to a clean dust free work area for repair.
1. Remove the other outside nut (66).
2. Remove all nuts (28) and washers (30).
3. Separate the side plate from tie rods (29).

- Plain & Geared Wheel Disassembly

LCA015S/LCA030D

1. Remove retainer ring (49) and pull wheel (50) off of axle
2. Remove retainer ring (47) and pull bearing(s) (48) out of wheel.
a-Large wheel :
 1. Remove retainer ring (33) and pull wheel (51) off of axle.
2. Remove retainer ring (31) and pull bearing(s) (32) out of wheel.
b-Small wheel :

- Return Sprocket Wheel Disassembly

1. Remove nut (20) and pull axle (21) from sprocket wheel support.
2. Separate sprocket wheel assy from support.
3. Remove Bushing (22) and discard.

- 1.5 and 3 ton Motor Unit Disassembly

1. Disconnect air hoses from power unit.
2. Remove capscrews (18) and lockwashers (19).
3. Remove power unit assembly from trolley side plate.

1.5 and 3 ton Motor Disassembly

Refer to Dwg. D5240240

1. Remove capscrews (220) and lockwashers (221).
2. Remove plate (222). Remove key (218) from spindle shaft (217).
3. Remove gears (226, 227, 229), washers (223) and thrust race (228) from motor housing (254).

Spindle assembly (215 through 219) should not be removed from plate (222) unless repair is required.

4. To remove spindle assembly from plate:
 - a. Remove retainer ring (219).
 - b. Tap end of spindle shaft (217) to remove from plate (222).
5. To remove motor assembly (items 239 through 251):
 - a. Remove capscrews (238) from brake cone (237).
 - b. Grasping pinion shaft (231) pull assembly free of motor housing (254).
6. To disassemble motor assembly (items 239 through 251):
 - a. Remove nut (230) and separate components (231 through 251).

General Disassembly Hoist (LCA030S to LCA250Q)

Dwg..D5240459 / D5440207 / D5960678

1. Remove the chain and the bottom hook.
2. Remove the chain basket
3. Disconnect all hoses

- Trolley Disassembly

1. Remove the screw (41) and extract the motoreducer.
2. Remove the hoist to the support (54).
3. Remove the nut (58) (1 external side of the flange)
4. Remove the nut (51) (3 external side of the flange) and the external spacers.
5. Remove the sub assembly trolley flange (12) and the internal spacers
6. Remove the return sprocket wheel support (11)
7. Remove the support (54) and the spacer ring (29).
8. Remove another motorised trolley flange unit (13).

- Plain & Geared Wheel Disassembly

LCA030S/LCA060D/LCA070D

1. Remove the external retainer ring(3) and extract the rollers wheel (9)
2.). Remove the internal retainer ring(63) and extract the ball bearing (33)

Plain & Geared Wheel Disassembly

LCA060S to LCA250Q

1. Remove the nut (50) and extract the roller axle (25).
2. Remove the distance ring (32) and the "O" ring (60).
3. Remove the retainer ring(65) and extract the rollers bearings (33).

- Return Sprocket Wheel Disassembly

1. Remove the nut (50) and extract the axle (15).
2. Remove the distance ring (17) and extract the return wheel (14).
3. Remove the rollers bearings (34) and the distance ring (18).
4. Remove the nut (49) and extract the screw (44).
5. Remove the roller (22).

Accessing the Brake

Refer to same disassembly instructions in the Maintenance Manual SAM0208

2HP & 4 HP with Emergency Stop and Overload

Refer to same disassembly instructions in the Maintenance Manual SAM0208

Reduction Housing

Refer to same disassembly instructions in the Maintenance Manual SAM0208

Chain guide Housing

Refer to same disassembly instructions in the Maintenance Manual SAM0208

Clear Inspection & repair

Cleaning

Use the following procedures to clean, inspect and repair the components of the hoist.

CAUTION

• **Bushings that rotate in the frame or are loose or worn must be replaced. Failure to observe this precaution will result in additional component damage.**

Clean all hoist component parts in solvent (except for the friction discs). The use of a stiff bristle brush will facilitate the removal of accumulated dirt and sediments on the gears and frames. If bushings have been removed, it maybe necessary to carefully scrape old Loctite ® from the bushing bores. Dry each part using low pressure, filtered compressed air.

Inspection

All disassembled parts should be inspected to determine their fitness for continued use. Pay particular attention to the following:

1. Inspect all gears for worn, cracked or broken teeth.
2. Inspect all bushings for wear, scoring or galling.
3. Inspect shafts for ridges caused by wear. If ridges caused by wear are apparent on shafts, replace the shaft.
4. Inspect all threaded items and replace those having damaged threads.
5. Measure the thickness of the friction disc. Replace the friction discs if the grooves are no longer visible.

Repair

Actual repairs are limited to the removal of small burrs and other minor surface imperfections from gears and shafts. Use a fine stone or emery cloth for this work.

1. Worn or damaged parts must be replaced. Refer to the applicable Parts Listing for specific replacement parts information.
2. Inspect all remaining parts for evidence of damage. Replace or repair any part which is in questionable condition. The cost of the part is often minor in comparison with the cost of redoing the job.
3. Smooth out all nicks, burrs or galled spots on shafts, bores, pins or bushings.
4. Examine all gear teeth carefully and remove nicks or burrs.
5. Polish the edges of all shaft shoulders to remove small nicks which may have been caused during handling.
6. Remove all nicks and burrs caused by lockwashers.

Assembly

Brake

Refer to same Assembly instructions in the Maintenance Manual SAM0208

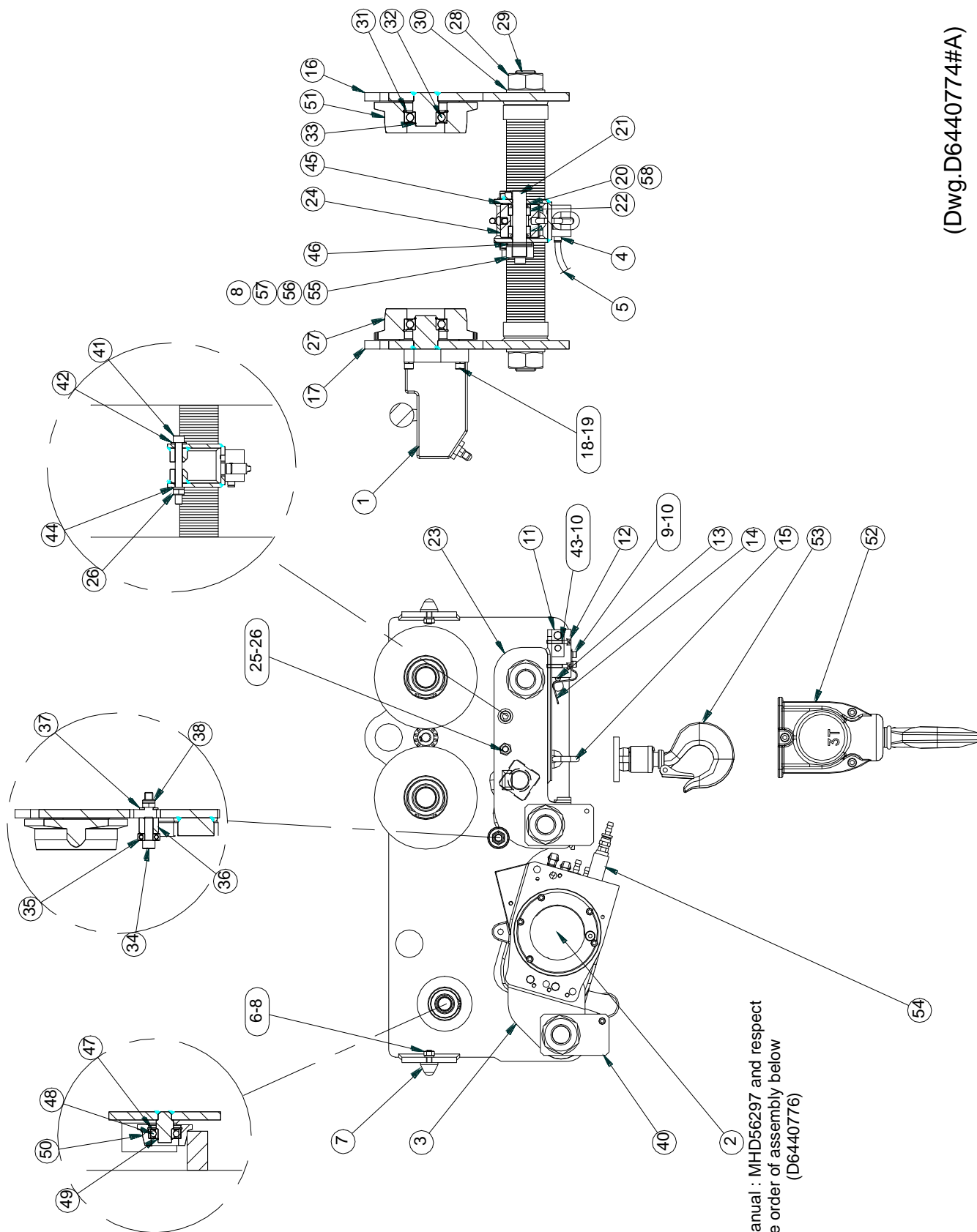
2HP & 4 HP with Emergency Stop and Overload

Refer to same Assembly instructions in the Maintenance Manual SAM0208

Reduction Housing

Refer to same Assembly instructions in the Maintenance Manual SAM0208

LC2A015S/030DIP3LVU... HOIST ASSEMBLY DRAWING



(Dwg.D6440774#A)

LC2A015S/030DIP3LVU... HOIST ASSEMBLY PARTS LIST

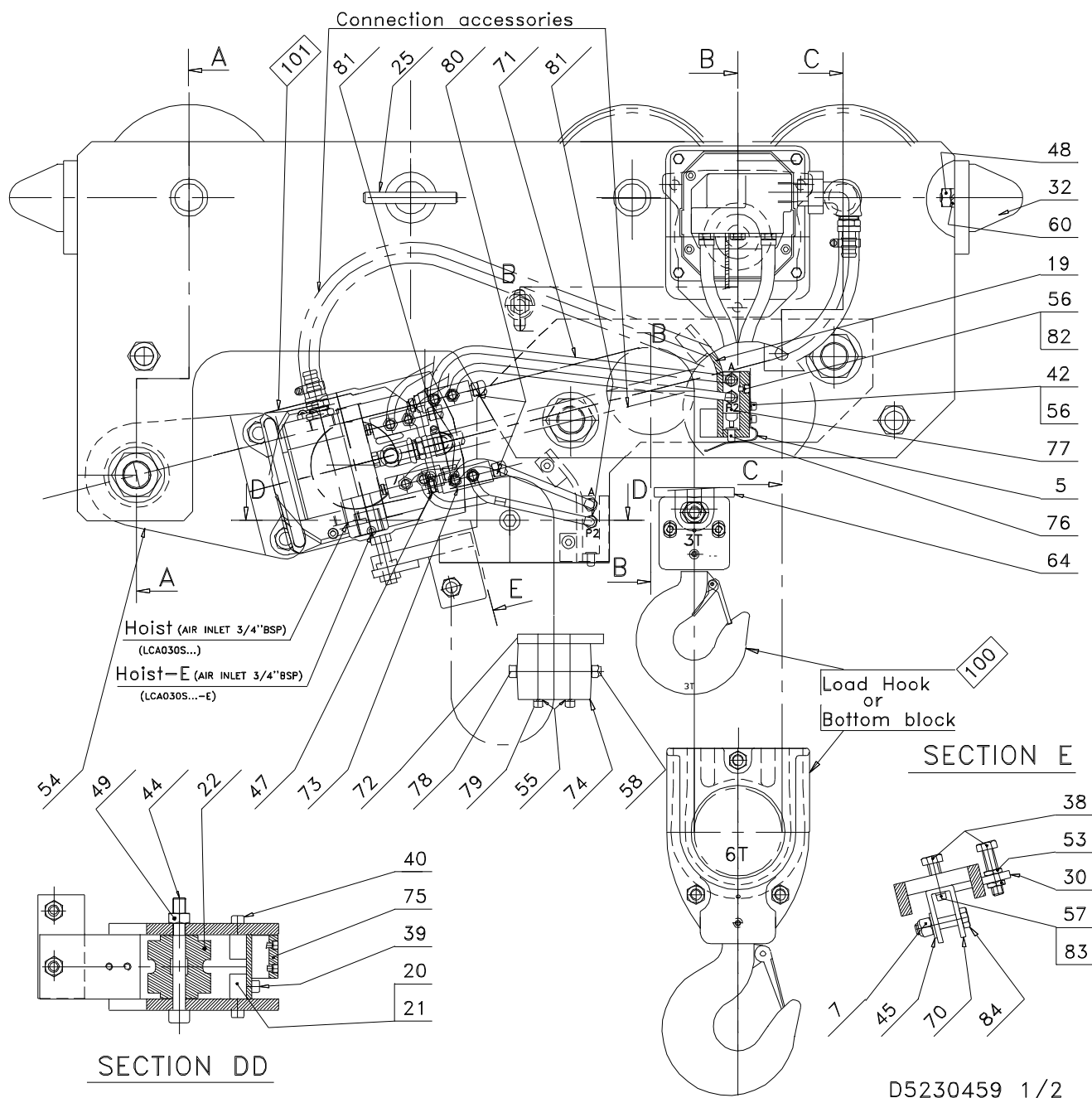
ITEM NO.	DESCRIPTION OF PART	QTY TOTAL.	PART NO.	
			STANDARD	OPTION 'R'
1	Motor	1	96090229	
2	Hoist assembly	1	Refer MHD56297	
3	Hoist support	1	96440391	
4	Fitting	4	61660732	
5	Hose	M	68062032	
6	Nut	4	43003511	
7	Bumper	4	69805541	
8	Lockwasher	5	45201008	
9	Screw	2	41326306	
10	Lockwasher	4	45201005	
11	Air control valve	1	68552732	
12	Limit switch protector	1	95960030	
13	Pusher	1	95960031	
14	Spring plate	1	95240144	
15	Load chain	M	69089432	
16	Side plate	1	9440384	
17	Side plate (motor)	1	96440385	
18	Screw	4	41325006	
19	Lockwasher	4	45201008	
20	Ring	2	95240254	
21	Sprocket axle	1	96450025	
22	Needle Bearing	2	56462813	
23	Sprocket support	1	95248126	
24	Sprocket wheel	2	95248139	
25	Tie rod	1	95240193	
26	Nut	5	43006911	
27	Plain wheel	2	95247066	95247072
28	Nut	6	43006711	
29	Tie rod	3	95240148	
30	Washer	170	45000130	
31	Retainer ring	4	47703062	
32	Bearing	4	50150006	
33	Retainer ring	4	47700030	
34	Screw	1	41329606	
35	Bearing	1	50150001	
36	Distance bearing	1	95230138	
37	Washer	1	45001112	
38	Locknut	4	43706311	
40	Chain container support	4	96440390	
41	Screw	1	41326506	
42	Washer	1	45001110	
43	Screw	2	41322106	
44	Lockwasher	1	45201010	
45	Trust bearing	2	57319832	
46	Pin	1	46501420	
47	Retainer ring	2	47703047	

LC2A015S/030DIP3LVU... HOIST ASSEMBLY PARTS LIST

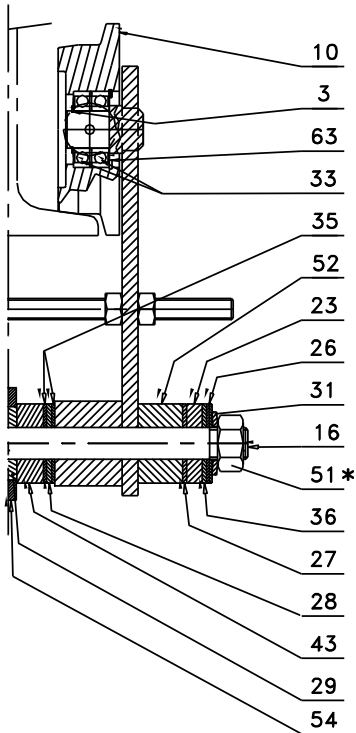
ITEM NO.	DESCRIPTION OF PART	TOTAL QTY.	PART NO.	
			STANDARD	OPTION 'R'
48	Bearing	2	50150004	
49	Retainer ring	2	47700020	
50	Plain wheel	2	95700001	96090180
51	Geared wheel	2	95247065	95247071
52	Double fall bottom hook assembly (3 Tons)	1	74240111	74240113
53	Single fall bottom hook assembly (1.5 Ton)	1	74240110	74240112
54	Connector	1	95230151	
55	Stop	1	95240255	
56	Screw	1	41333206	
57	Nut	1	43706511	
58	O Ring	2	58215829	

• Recommended Spare

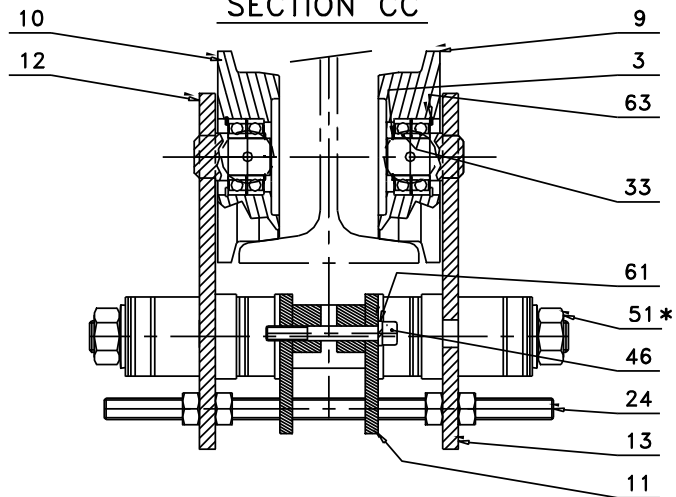
AIR CHAIN HOIST ASSEMBLY DRAWING LCA030S / LCA060D / LCA070D



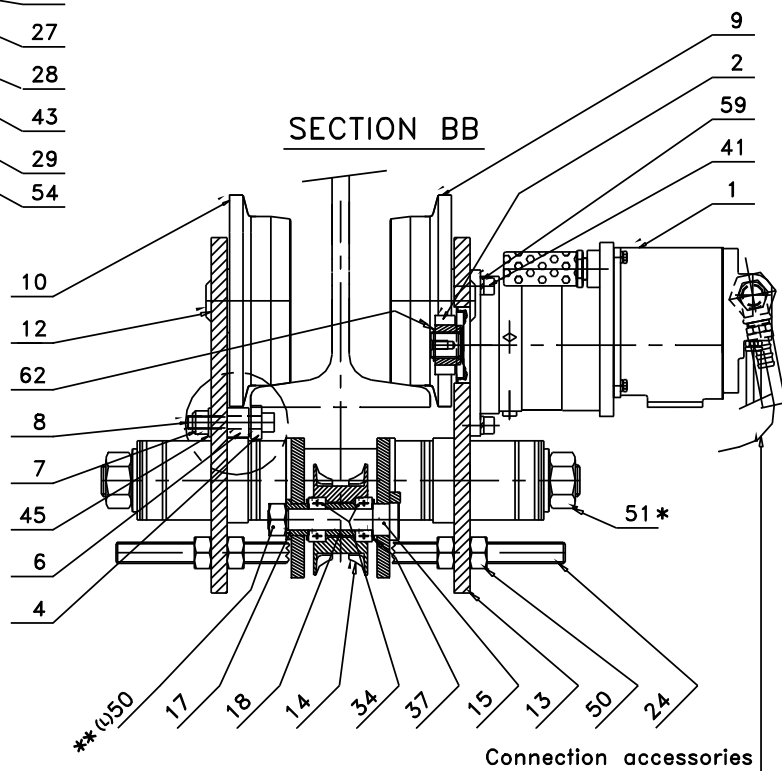
SECTION AA



SECTION CC



SECTION BB



(L) :Loctite (R) frein filet 243

** Couple de serrage:15mdaN

* Couple de serrage:55mdaN

D5230459 2/2

AIR CHAIN HOIST ASSEMBLY PARTS LIST LCA030S / LCA060D./LCA070D

ITEM NO.	DESIGNATION PIECE	DESCRIPTION OF PART	TOTAL QTY	PART NO	
				STANDARD	OPTION 'R '
1	Moto-réducteur frein	Air Moto-rducer with brake	1	3546-0001	
2	Pignon 12 dents	2 theeth pinion	1	9523-0010	
3	Circlips E35	Retainer Ring	6	4770-0035	
4	Roulement à billes	Roller bearing	1	5015-0001	
5	Lame ressort	Spring plate	1	9523-0058	
6	Bague entretoise	Distance washer	1	9523-0138	
7	Ecrou frein	Locknut	2	4370-6311	
8	Vis CHc	Screw	1	4132-9606	
9	Galet avec couronne dentée	Roller with teeth ring-gear	2	9523-7011	9523-7040
10	Galet lisse	Roller	4	9523-7012	9523-7041
11	Support noix de renvoi	Return sprocket wheel support	1	9523-8096	
12	Flasque chariot	trolley flange	1	9523-8148	
13	Flasque chariot	Trolley flange	1	9523-8147	
14	Noix de renvoi	Return sprocket wheel	1	9523-8055	9523-8114
15	Axe de noix de renvoi	Return sprocket wheel axle	1	9523-7056	
16	Tirant	Tie axle	3	9523-7098	
17	bague	Ring	1	9523-0060	
18	Rondelle entretoise	Distance washer	1	9523-0062	
19	Support fin de course	Limit switch support	2	9523-0063	
20	Plat de fixation supérieur	Upper flat steel bar	2	9523-0064	
21	Plat de fixation intérieur	Internal flat steel bar	2	9523-0065	
22	Galet	Roller	1	9523-0069	
23	Cale ep:15	Adjusting wedge	6	9523-0105	
24	Tige fileté	Screw rod	2	9523-0097	
25	Axe de verrouillage du chariot	Latching axle of trolley	1	9523-0110	
26	Cale ep:2,5	Adjusting wedge	12	9523-0100	
27	Cale ep:3,5	Adjusting wedge	6	9523-0102	
28	Cale ep:5	Adjusting wedge	6	9523-0104	
29	Bague entretoise	Distance Ring	1	9523-0150	
30	Plat	Flat	1	9523-0086	
31	Rondelle ressort	Spring washer	6	9523-0115	
32	Butée progressive	Progressive stop	4	6988-6832	
33	Roulement à billes	Roller bearing	12	5017-0007	
34	Roulement à rouleaux	Roller bearing	2	5190-0004	
35	Cale ep:3	Adjusting wedge	12	9523-0101	
36	Cale ep:4	Adjusting wedge	6	9523-0103	
37	Joint	Joint	2	5834-4020	
38	Vis H M12	Screw	2	4102-0001	
39	Vis CHC M8	Screw	4	4132-1806	
40	Vis CHC M8	Screw	8	4132-4906	
41	Vis CHC M10	Screw	3	4132-3506	
42	Vis CHC M5	Screw	2	4132-6306	
43	Cale ep:25	Adjusting wedge	6	9523-0106	
44	Vis CHC M14	Screw	1	4130-8606	
45	Rondelle M12	Washer	2	4500-1112	
46	Vis CHC M14	Screw	1	4132-9106	
47	Manchon M.M 1/8"	Nipple	2	6138-5232	
48	Ecrou Hu M12	Nut	4	4300-3611	
49	Ecrou Frein M14	Locknut	1	75589M	
50	Ecrou Hu M20	Nut	9	4300-7311	
51	Ecrou Hu M30	Nut	6	4300-6711	

AIR CHAIN HOIST ASSEMBLY PARTS LIST LCA030S / LCA060D / LCA070D

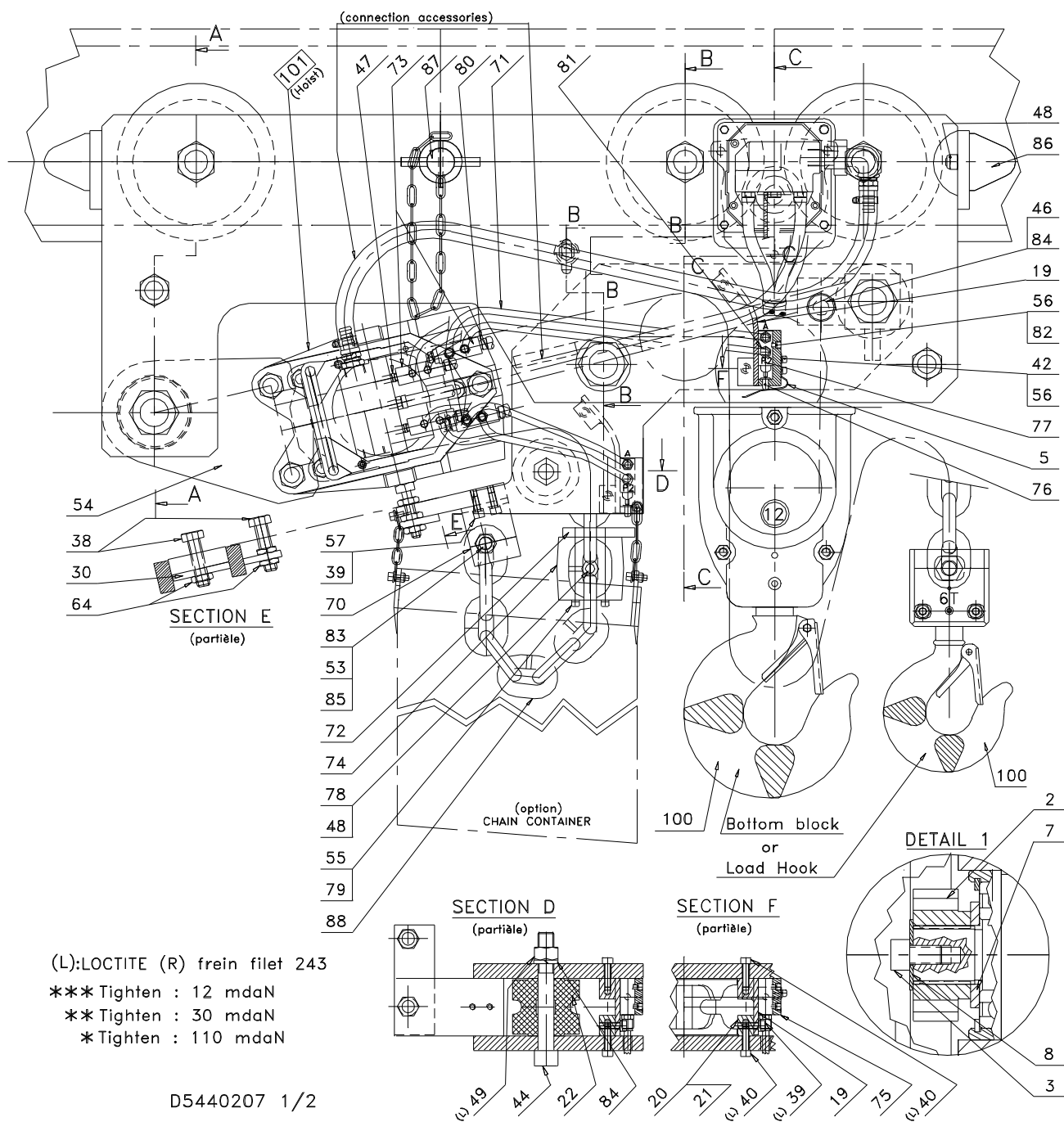
ITEM NO.	DESIGNATION PIECE	DESCRIPTION OF PART	TOTAL QTY	PART NO	
				STANDARD	OPTION 'R '
52	Cale ep:42,5	Adjusting wedge	6	9523-0107	
53	Ecrou Hm M12	Nut	3	4320-2212	
54	Support palan	Support	1	9523-0149	
55	Rondelle plate M6 U	Washer	2	4500-1106	
56	Rondelle frein W5	Split washer	6	4520-1005	
57	Rondelle frein W6	Split washer	2	4520-1006	
58	Ecrou frein M8	Locknut	1	75582M	
59	Rondelle frein W10	Split washer	3	4520-1010	
60	Rondelle frein W12	Split washer	4	4520-1012	
61	Rondelle frein W14	Split washer	1	4520-1014	
62	Circlips E25	Retainer Ring	1	4770-0025	
63	Circlips I72	Retainer Ring	6	4770-3072	
64	Rondelle en croix	Crosswise washer	1	9412-0118	
70	Support de chaine	Chain support	1	9412-0198	
71	Tube lg:0,5mx4	Hose	2m	6806-2032	
72	Rondelle en croix	Crosswise washer	1	9523-0067	
73	Raccord 1/8 ''	Fitting adapter	2	9523-0151	
74	Manchon amortisseur	Sleeve	1	9523-0066	
75	Protecteur de fin de course	Limit switch protector	2	9596-0030	
76	Poussoir	Pusher	2	9596-0031	
77	Distributeur 3/2 cde directe	Control valve with direct control	2	6855-2732	
78	Vis Chc M8	Screw	1	70926M	
79	Vis Chc M6	Screw	2	4132-2506	
80	About annelé	Fitting	2	6162-9732	
81	Raccord instantané	Fitting	8	6166-0732	
82	Vis CHC M5	Screw	4	4132-2106	
83	Vis CHC M6	Screw	2	4132-2606	
84	Vis M12	Screw	1	4132-5206	
89	Chaine (mètre de levée:3T/6T)	Chain (meter of lift:3T/6T)		69087432	
100	Crochet 3T Moufle 6T	3T Hook		3412-0144	3412-0146
		6T Bottom Block		3412-0145	3412-0147
101	Palan LCA030S/060D...	Hoist LCA030S/060D...		Refer to SAM0208	

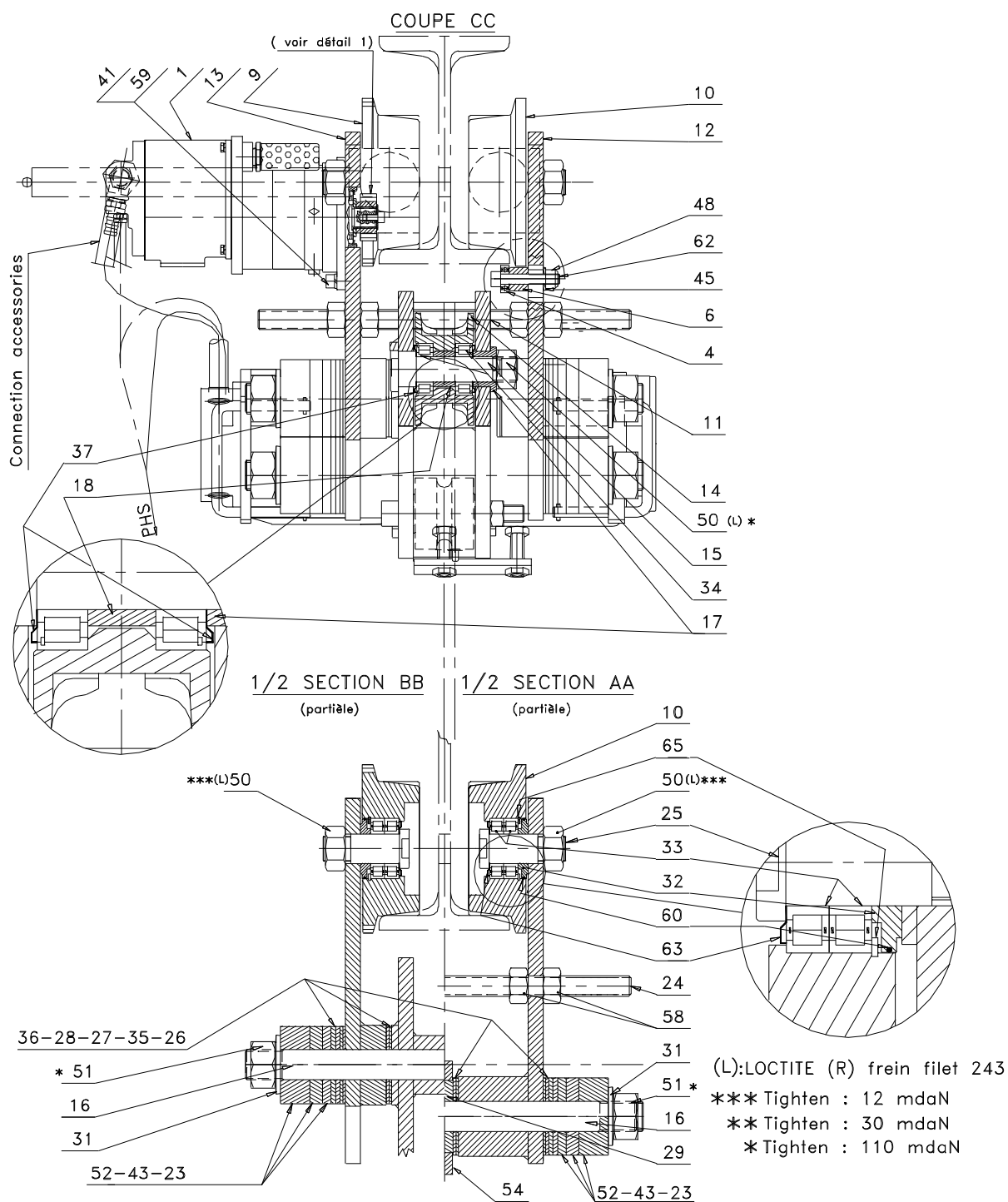
SPECIFIC PIECES FOR LCA070D

ITEM NO.	DESIGNATION PIECE	DESCRIPTION OF PART	TOTAL QTY	PART NO	
				STANDARD	OPTION 'R '
9	Galet avec couronne dentée	Roller with teeth ring-gear	2	9523-7040	-
10	Galet lisse	Roller	4	9523-7041	-
14	Noix de renvoi	Return sprocket wheel	1	9523-0194	
15	Axe de noix de renvoi	Return sprocket wheel axle	1	9523-0196	
17	bague	Ring	1	9523-0195	
34	Roulement à rouleaux	Roller bearing	2	5194-0004	
54	Support palan	Support	1	9523-0197	
89	Chaine (mètre de levée:7T)	Chain (meter of lift:7T)		6905-4232	
100	Moufle 7T	7T Bottom Block		3412-0576	-

● Pièces de rechange recommandées /Recommended Spare

AIR CHAIN HOIST ASSEMBLY DRAWING LCA060S / LCA80D / LCA120D





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AIR CHAIN HOIST ASSEMBLY PARTS LIST LCA060S / LCA80D / LCA120D

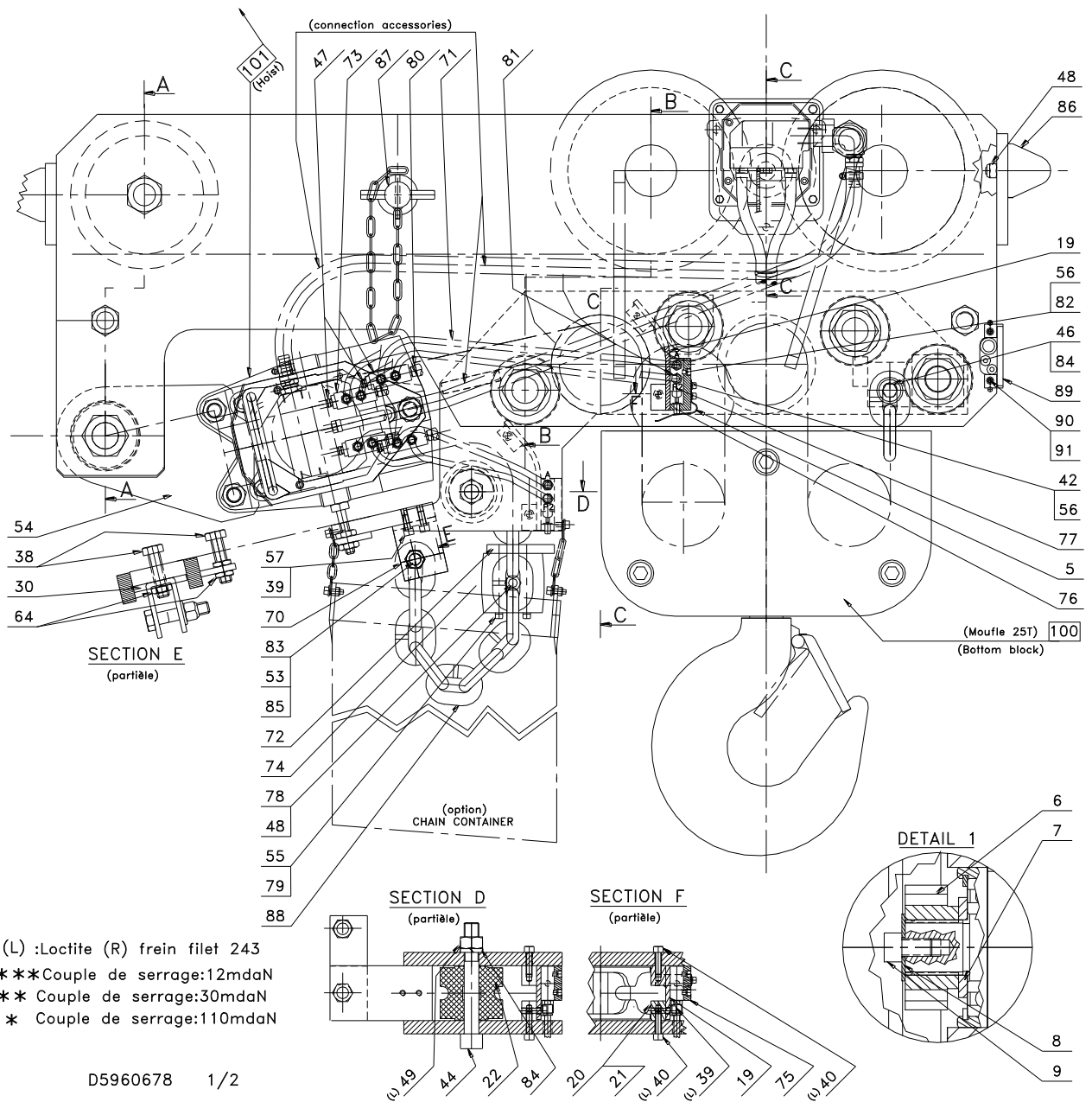
ITEM NO.	DESIGNATION PIECE	DESCRIPTION OF PART	TOTAL QTY	PART NO	
				STANDARD	OPTION 'R '
1	Moto-réducteur frein	Air Moto-rducer with brake	1	7546-0001	
2	Pignon 12 dents	2 theeth pinion	1	9523-0010	
3	Vis Chc M8x10	Screw	1	4132-5606	
4	Roulement à billes	Roller bearing	1	5015-0001	
5	Lame ressort	Spring plate	1	9523-0058	
6	Bague entretoise	Distance washer	1	9523-0138	
7	Rondelle Z24	Flat Washer	1	4500-1424	
8	Rondelle LL8	Flat Washer	1	4570-1008	
9	Galet dentée(IPE)	Geared Wheel (Flat beam IPE)	2	9544-7006	9544-7070
	Galet dentée(IPN)	Geared Wheel (Flat beam IPN)	2	9544-7008	9544-7017
10	Galet lisse (IPE)	Plain Wheel (Flat beam IPE)	4	9544-4007	9544-7069
	Galet lisse (IPN)	Plain Wheel (Flat beam IPN)		9544-7007	9544-7018
11	Support noix de renvoi	Return sprocket wheel support	1	9544-8133	
12	Flasque chariot	Trolley flange	1	9544-8141	
13	Flasque chariot coté MRF	Trolley flange (geared)	1	9544-8140	
14	Noix de renvoi	Return sprocket wheel	1	9544-8024	95448118
15	Axe de noix de renvoi	Return sprocket wheel axle	1	9544-7025	
16	Tirant	Screw Rod	3	9544-7124	
17	Bague Epaulée	Distance Ring	1	9544-0027	
18	Bague entretoise	Distance Ring	1	9544-0028	
19	Support fin de course	Limit switch support	2	9544-0029	
20	Plat de fixation supérieur	Upper flat steel bar	2	9544-0030	
21	Plat de fixation inférieur	Internal flat steel bar	2	9544-0031	
22	Galet	Roller	1	9544-0032	
23	Cale ep:15	Spacer (15mm)	6	9544-0131	
24	Tige fileté	Screw Rod	2	9544-0123	
25	Axe de galet	Roller axle	6	9523-7017	
26	Cale ep:2,5	Spacer (2.5mm)	6	9544-0125	
27	Cale ep:3,5	Spacer (3.5mm)	12	9544-0127	
28	Cale ep:5	Spacer (5mm)	6	9544-0128	
29	Bague entretoise	Spacer Ring	1	9544-0143	
30	Plat	Flat	1	9544-0041	
31	Rondelle ressort	Spring washer	6	9544-0119	
32	Bague entretoise	Distance ring	6	9544-0004	
33	Roulement à rouleaux NJ207	Roller bearing	12	5120-0007	
34	Roulement à rouleaux SL18 2206	Roller bearing	2	5190-0206	
35	Cale ep:3	Spacer (3mm)	6	9544-0126	
36	Cale ep:6	Spacer (6mm)	6	9544-0129	
37	Joint NILOS	Joint	2	5833-4006	
38	Vis HM 16x45	Screw	2	4101-0801	
39	Vis CHC M8x20	Screw	6	4132-1806	
40	Vis CHC M8x30	Screw	8	4132-5006	
41	Vis CHC M10x30	Screw	3	4132-3506	
42	Vis CHC M5x10	Screw	2	4132-6306	
43	Cale ep:10	Spacer (10mm)	6	9544-0130	

AIR CHAIN HOIST ASSEMBLY PARTS LIST LCA060S / LCA80D / LCA120D

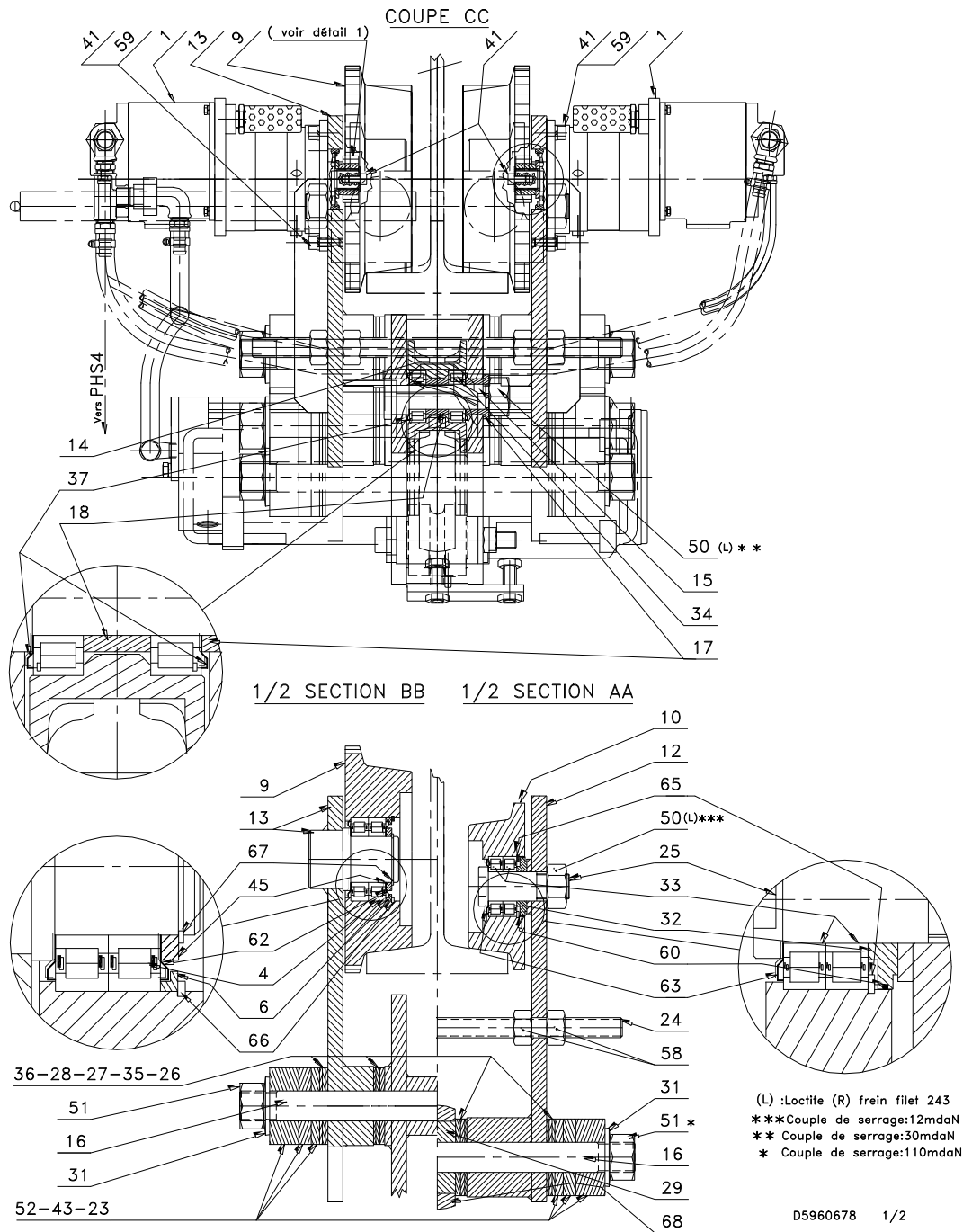
ITEM NO.	DESIGNATION PIECE	DESCRIPTION OF PART	TOTAL QTY	PART NO	
				STANDARD	OPTION 'R '
44	Vis CHC M20x150	Screw	1	4132-1606	
45	Rondelle M12	Washer	1	4500-1112	
46	Vis CHC M20x130x52	Screw	1	4132-3906	
47	Manchon M.M 1/8"	Nipple	2	6138-5232	
48	Ecrou frein M12	Locknut	5	4370-6311	
49	Ecrou Hu M20	Nut	1	4300-7311	
50	Ecrou Hu M30	Nut	7	4300-6711	
51	Ecrou Hu M36	Nut	6	4300-7411	
52	Cale ep:35	Spacer (35mm)	6	9544-0132	
53	Rondelle M16	Washer	1	4500-1116	
54	Support palan	Support	1	9544-8142	
55	Rondelle plate M6 U	Washer	2	4500-1106	
56	Rondelle frein W5	Split washer	6	4520-1005	
57	Rondelle frein W5	Split washer	2	4520-1008	
58	Ecrou Hu M24	Nut	8	4300-6111	
59	Rondelle frein W10	Split washer	3	4520-1010	
60	Joint torique	'O'Ring	6	5821-2629	
62	Vis Chc M12	Screw	1	4132-9606	
63	Joint Nylos	Joint	6	5830-4207	
64	Ecrou Hm16	Nut	3	4320-2412	
65	Circlips I72	Retainer Ring	6	4770-3072	
70	Support de chaîne	Chain support	1	9526-0051	
71	Tube lg:0,5mx4	Hose	2m	6806-2032	
72	Rondelle en croix	Crosswise washer	1	9590-0025	
73	Raccord 1/8"	Fitting adapter	2	9523-0151	
74	Manchon amortisseur	Sleeve	1	9544-0075	
75	Protecteur de fin de course	Limit switch protector	2	9596-0030	
76	Poussoir	Pusher	2	9596-0031	
77	Distributeur 3/2 cde directe	Control valve with direct control	2	6855-2732	
78	Vis Chc M12x100	Screw	1	4132-2006	
79	Vis Chc M6x90	Screw	2	4132-8206	
80	About annelé	Fitting	2	51029 68237528	
81	Raccord instantanés	Fitting	8	6166-0732	
82	Vis CHC M5x30	Screw	4	4132-2106	
83	Vis Chc M16	Screw	1	4132-1906	
84	Rondelle frein W20	Split washer	2	4520-1020	
85	Ecrou frein M16	Locknut	1	4370-3711	
86	Butée progressive	Bumper	4	6988-6832	
87	Axe de verrouillage chariot	Latching axle of trolley	1	9523-0110	
88	Chaîne (mètre de levée:6T/12T)	Chain (meter of lift:6T/12T)		6908-7532	
100	Crochet 6T	6T Hook	1	7526-0100	75267102
	Moufle 12T	12T Bottom Block		7526-0101	75260103
101	Palan LCA060S / LCA120D...	Hoist LCA060S / LCA120D		Refer to SAM0208	

● Pièces de rechange recommandées /Recommended Spare

AIR CHAIN HOIST ASSEMBLY DRAWING LCA250Q



AIR CHAIN HOIST ASSEMBLY DRAWING LCA250Q



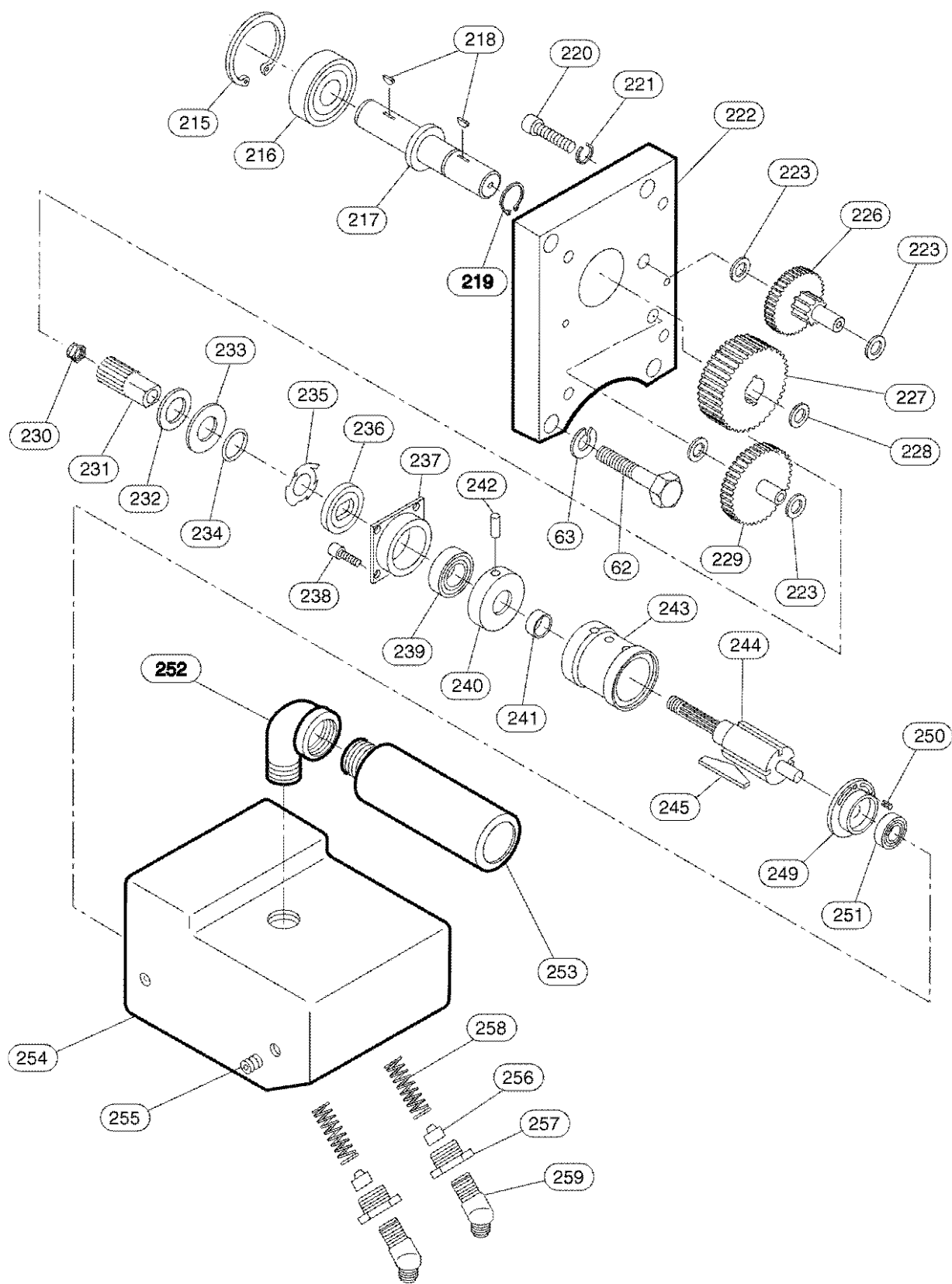
AIR CHAIN HOIST ASSEMBLY PARTS LIST LCA250Q

ITEM NO.	DESIGNATION PIECE	DESCRIPTION OF PART	TOTAL QTY	PART NO	
				STANDARD	OPTION 'R '
1	Moto-réducteur frein	Air Moto-rducer with brake	2	3546-0001	
2	Pignon 12 dents	2 theeth pinion	2	9523-0010	
3	Vis Chc	Screw	2	4132-5606	
4	Roulement à rouleaux	Roller bearing	8	5120-0011	
5	Lame ressort	Spring plate	1	9523-0058	
6	Bague entretoise	Distance washer	4	9596-0045	
7	Eondelle Z24	Flat Washer	2	4500-1424	
8	Rondelle LL8	Flat Washer	2	4570-1008	
9	Galet avec couronne dentée (IPE) (IPN)	Roller with teeth ring-gear (IPE) (IPN)	4	9629-7019	9629-7053
			4	9629-7021	9596-7043
10	Galet lisse (IPE) (IPN)	Roller (IPE) (IPN)	2	9544-7005	9544-7069
			2	9544-7007	9544-7018
11	Support noix de renvoi	Return sprocket wheel support	1	9596-8087	
12	Flasque chariot	trolley flange	1	9596-8090	
13	Flasque chariot	Trolley flange	1	9596-8089	
14	Noix de renvoi	Return sprocket wheel	2	95448024	95448118
15	Axe de noix de renvoi	Return sprocket wheel axle	2	9544-7025	
16	Tirant	Tie axle	5	9544-7124	
17	bague	Ring	2	9544-0027	
18	Bague entretoise	Distance ring	2	9544-0028	
19	Support fin de course	Limit switch support	2	9544-0029	
20	Plat de fixation supérieur	Upper flat steel bar	2	9544-0030	
21	Plat de fixation inférieur	Internal flat steel bar	2	9544-0031	
22	Galet	Roller	1	9544-0032	
23	Cale ep:15	Adjusting wedge	10	9544-0131	
24	Tige fileté	Screw rod	2	9544-0123	
25	Axe de galet	Roller axle	2	9523-7017	
26	Cale ep:2,5	Adjusting wedge	10	9544-0125	
27	Cale ep:3,5	Adjusting wedge	20	9544-0127	
28	Cale ep:5	Adjusting wedge	10	9544-0128	
29	Bague entretoise	Distance Ring	1	9544-0143	
30	Plat	Flat	1	9544-0041	
31	Rondelle ressort	Spring washer	10	9544-0119	
32	Bague entretoise	Distance ring	2	9544-0004	
33	Roulement à rouleaux	Roller bearing	4	5120-0007	
34	Roulement à rouleaux	Roller bearing	4	5190-0206	
35	Cale ep:3	Adjusting wedge	10	9544-0126	
36	Cale ep:6	Adjusting wedge	10	9544-0129	
37	Joint	Joint	4	5833-4006	
38	Vis H M16x45	Screw	2	4101-0801	
39	Vis CHC M8x20	Screw	6	4132-1806	
40	Vis CHC M8	Screw	8	4132-5006	
41	Vis CHC M10	Screw	6	4132-3506	
42	Vis CHC M5	Screw	2	4132-6306	
43	Cale ep:10	Adjusting wedge	10	9544-0130	
44	Vis CHC M20x150	Screw	1	4132-1606	

AIR CHAIN HOIST ASSEMBLY PARTS LIST LCA250Q

ITEM NO.	DESIGNATION PIECE	DESCRIPTION OF PART	TOTAL QTY	PART NO	
				STANDARD	OPTION ‘R ‘
45	Rondelle entretoise	Distance washer	4	9596-0044	
46	Vis CHC M20x130x52	Screw	1	4132-3906	
47	Manchon M.M 1/8’’	Nipple	2	6138-5232	
48	Ecrou frein M12	Locknut	4	4370-6311	
49	Ecrou Hu M20	Nut	1	4300-7311	
50	Ecrou Hu M30	Nut	4	4300-6711	
51	Ecrou Hu M36	Nut	10	4300-7411	
52	Cale ep:35	Adjusting wedge	10	9544-0132	
53	Rondelle Z16u	Washer	1	4500-1416	
54	Plaque de suspension	Suspension plate	1	9544-8142	
55	Rondelle plate M6 U	Washer	2	4500-1106	
56	Rondelle frein W5	Split washer	6	4520-1005	
57	Rondelle frein W8	Split washer	2	4520-1008	
58	Ecrou Hu M24	Nut	8	4300-6111	
59	Rondelle frein W10	Split washer	6	4520-1010	
60	Joint torique	‘O’Ring	2	5821-2629	
62	Joint nylos	Joint	8	5832-4111	
63	Joint nylos	Joint	2	5830-4207	
64	Ecrou Hm16	Nut	3	4320-2412	
65	Circlips I72	Retainer Ring	2	4770-3072	
66	Circlips I100	Retainer Ring	4	4770-3100	
67	Circlips E55	Retainer Ring	4	4770-0055	
70	Support de chaine	Chain support	1	9526-0051	
71	Tube lg:0,5mx4	Hose	2m	6806-2032	
72	Rondelle en croix	Crosswise washer	1	9590-0025	
73	Raccord 1/8 ’’	Fitting adapter	2	9523-0151	
74	Manchon amortisseur	Sleeve	1	9596-0029	
75	Protecteur de fin de course	Limit switch protector	2	9596-0030	
76	Poussoir	Pusher	2	9596-0031	
77	Distributeur 3/2 cde directe	Control valve with direct control	2	6855-2732	
78	Vis Chc M12	Screw	1	4132-2006	
79	Vis Chc M6	Screw	2	4132-8206	
80	About annelé	Fitting	2	6165-2632	
81	Raccord instantané	Fitting	8	6166-0732	
82	Vis CHC M5	Screw	4	4132-2106	
83	Vis CHc M16	Screw	1	4132-1906	
84	Rondelle frein W20	Split washer	2	4520-1020	
85	Ecrou frein M16	Locknut	1	4370-3711	
86	Butée progressive	Progressive stop	4	6988-6832	
87	Axe de verrouillage chariot	Latching axle of trolley	1	9596-0088	
88	Chaine (mètre de levée)	Chain (meter of lift)		3526-9907	
89	Support	Support	2	9596-0055	
90	Vis	Screw	4	4132-2306	
91	Ecrou frein	Locknut	4	4370-7611	
100	Moufle 25T	25T Bottom Block	1	35968048	
104	Palan LCA060S....	Hoist LCA060S....		Refer to SAM0208	
●	Pièces de rechange recommandées /Recommended Spare				

MOTOR ASSEMBLY DRAWING FOR HOISTS MODELS LC2A015S & LC2A030D



(Dwg.D5240240)

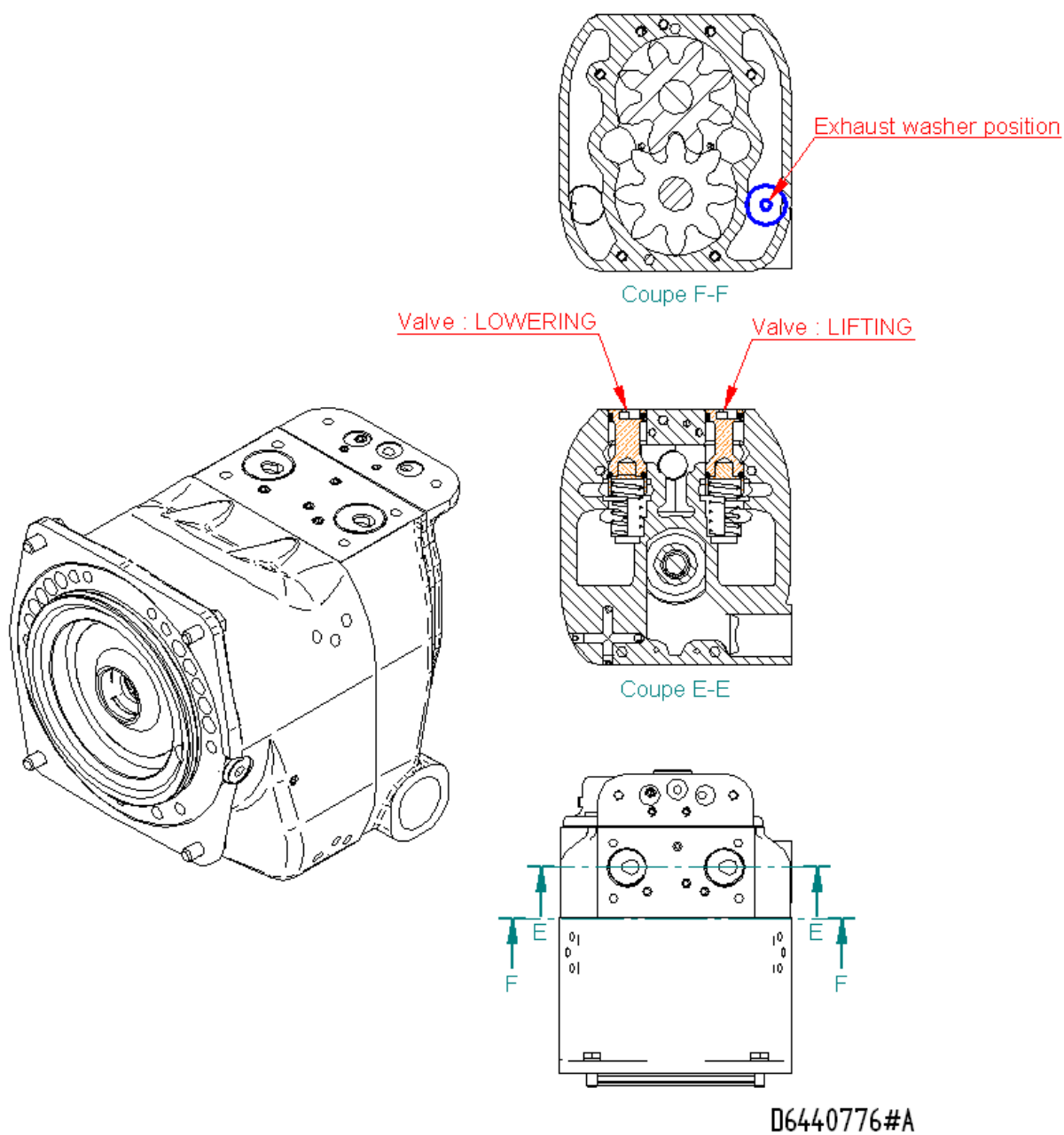
MOTOR ASSEMBLY PARTS LIST FOR HOISTS MODELS LC2A015S & LC2A030D

ITEM NO.	DESCRIPTION OF PART	QTY TOTAL.	PART NUMBER
	Power unit assembly	1	45615
	Motor assembly (items 239 to 251)	1	45612
62	Capscrew	4	41325006
64	Lockwasher	4	45201008
215	Retainer ring	1	Y147-16
216	Bearing	1	39163
217	Spindle shaft	1	45606
218	Key	2	37142
220	Capscrew	4	Y99-42
221	Lockwasher	4	Y14-416-C
222	Plate	1	45614
223	Washer	4	Y48-14
226	Gear	1	44768
227	Gear	1	44020-1
228	Thrust race	1	42384
229	Gear	1	44767
230	Nut	1	Y192-1-Z
231	Pinion shaft	1	45608
232	Spacer	1	37128
233	Washer	1	73473
• 234	'O' ring	1	Y325-13
• 235	Finger Spring	1	30297
• 236	Brake lining	1	45619
237	Brake cone	1	45617
238	Capscrew	4	Y154-52
239	Bearing	1	30469
240	End plate	1	45620
241	Spacer	1	30437
242	Roll pin (included with cylinder, item 243)	2	Y178-20
243	Cylinder (includes roll pin, item 242)	1	37683
244	Rotor	1	45605
• 245	Rotor blade	4	30741
249	End plate	1	31601
250	Pin	1	32814
• 251	Bearing	1	Y65-7
252	Elbow	1	Y43-3-C
253	Muller	1	43874-1
254	Motor Housing	1	45613
255	Pipe plug	2	Y227-2
256	Piston	2	45603
257	Inlet adapter	2	45609
• 258	Spring	2	45793
259	Fitting hose adapter	2	61629732

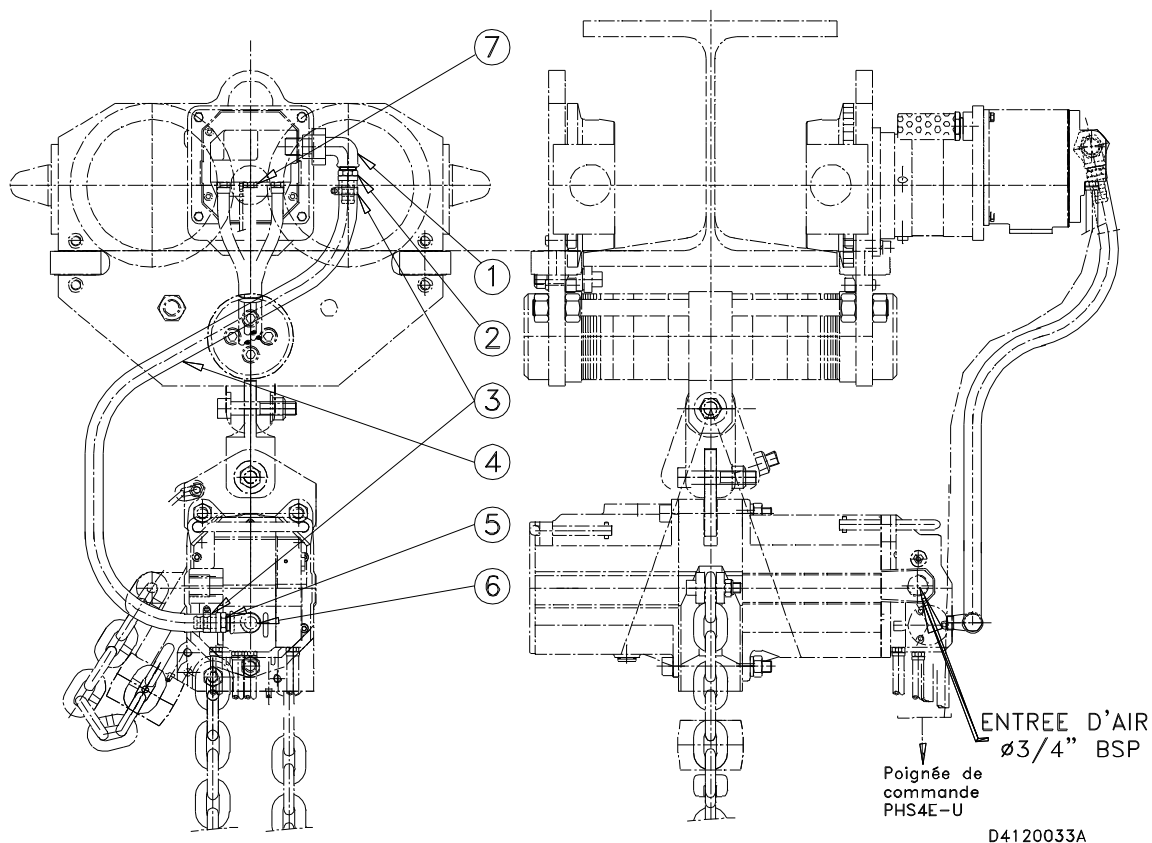
• Recommended Spare

WARNING : Motor Assembly for LC2A015S/LC2A030DIP3LRU...-E

To respect valves position and the exhaust washer position compared with the standard motor (see manual : MHD56297)



CONNECTION ACCESSORIES ASSEMBLY DRAWING & PARTS LIST

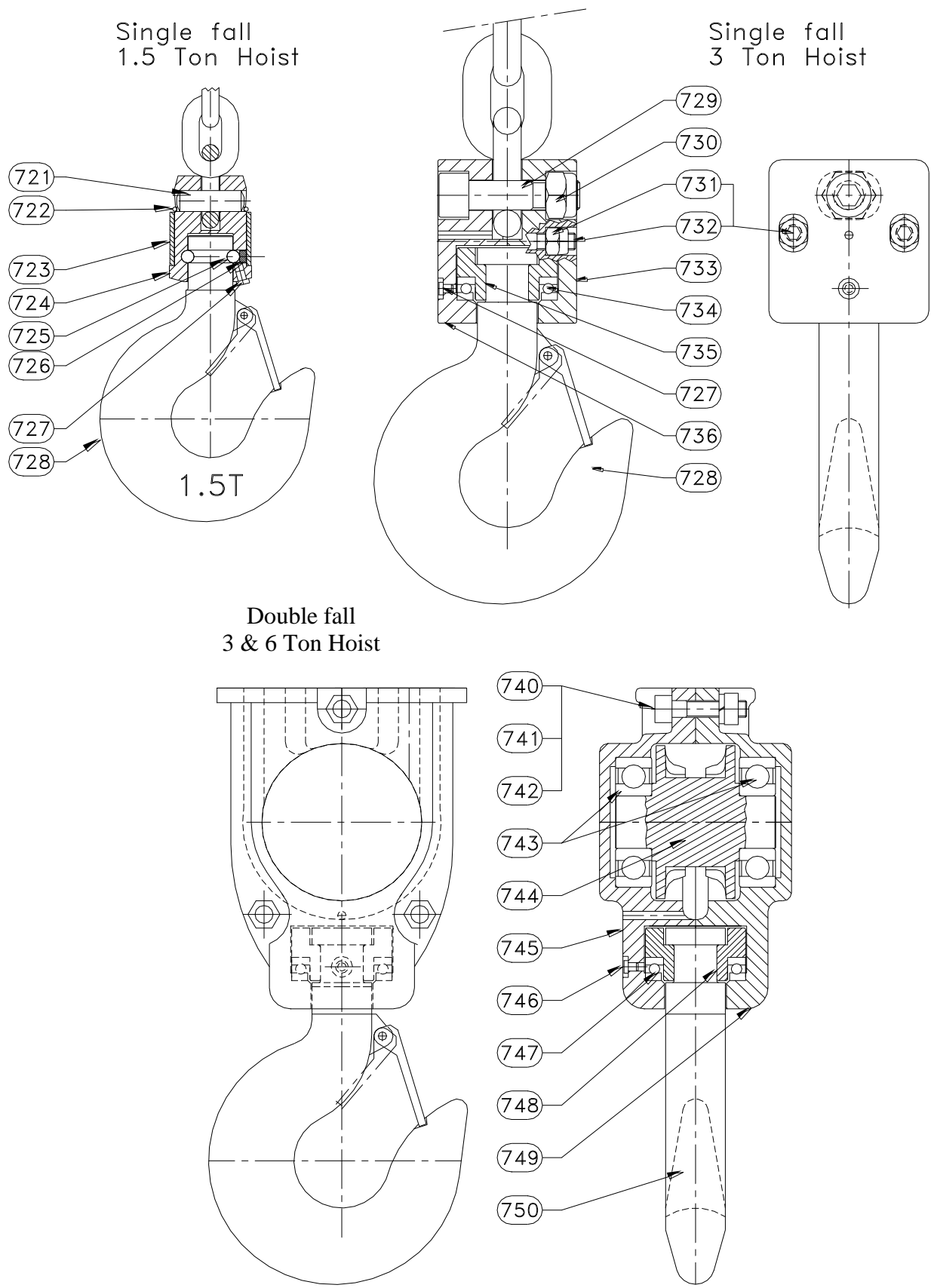


D4120033A

ITEM NO.	DESIGNATION PIECE	DESCRIPTION OF PART	TOTAL QTY	PART NO.
1	COUDE UNION 1/2"G	ELBOW	1	6814.4732
2	ABOUT ANNELE 1/2"G	FITTING	1	6163.1832
3	COLLIER DE SERRAGE	CLAMP COLLAR	2	6113.1532
4	FLEXIBLE	HOSE	1	6803.1332
5	ABOUT ANNELE 3/8"G	FITTING	1	6162.3328
6	COUDE M/F 3/8"G	ELBOW	1	6824.1132
7	BOUCHON	PLUG	1	6510.7741

SINGLE AND DOUBLE FALL BOTTOM HOOK ASSEMBLY DRAWING

(LC2A015S to 60D)



(Dwg.D4240229)

SINGLE AND DOUBLE FALL BOTTOM HOOK ASSEMBLY PARTS LIST

Single fall hoists

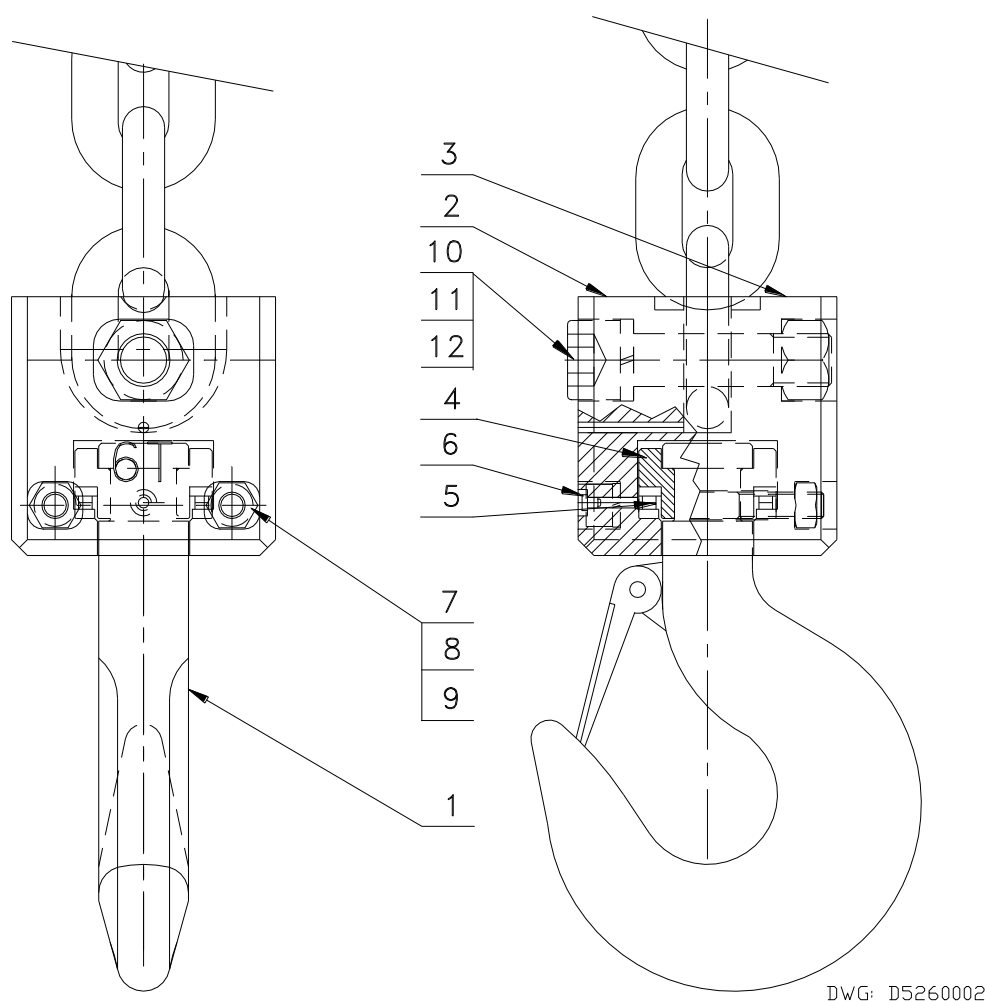
ITEM NO.	DESCRIPTION OF PART	QTY TOTAL.	PART NUMBER			
			1.5 Ton		3 Ton	
			Standard	Option 'R'	Standard	Option 'R'
721	Pin	1	46001916			
722	Retainer ring	1	96090148			
723	Ring	1	96090025	96090146		
724	Hook block	1	94240293	94240295		
725	Ball	11	69401125			
726	Plug	1	96090060			
727	Grease fitting	1	67102627		67102627	
728	Hook	1	94248358	94240294	94248357	94240296
729	Screw	1			41309006	
730	Nut	1			58250721	
731	Nut	2			58250739	
732	Screw CHC M8-45	2			41326206	
733	Half bottom block	1			94128393	94128400
734	Thrust bearing	1			54000006	
735	Ring 2-pieces	1			94247291	
736	Half bottom block	1			94128394	94128401

Double fall hoists

ITEM NO.	DESCRIPTION OF PART	QTY TOTAL.	PART NUMBER			
			3 Ton		6 Ton	
			Standard	Option 'R'	Standard	Option 'R'
740	Screw	3	41326706		41324406	
741	Nut	3	43003511		43003611	
742	Lockwasher	3	45201008		45201012	
743	Bearing	2	50250005		50250006	
744	Sprocket wheel	1	94240056	94240263	94120113	94120328
745	Half bottom block	1	94240289	94240297	94120397	94120404
746	Grease fitting	1	67102627		67102627	
747	Thrust bearing	1	54000006		54700007	
748	Ring 2-pieces	1	94247291		94127398	
749	Half bottom block	1	94240288	94240298	94120396	94120403
750	Hook	1	94248357	94240296	94128459	94128402

• Recommended Spare

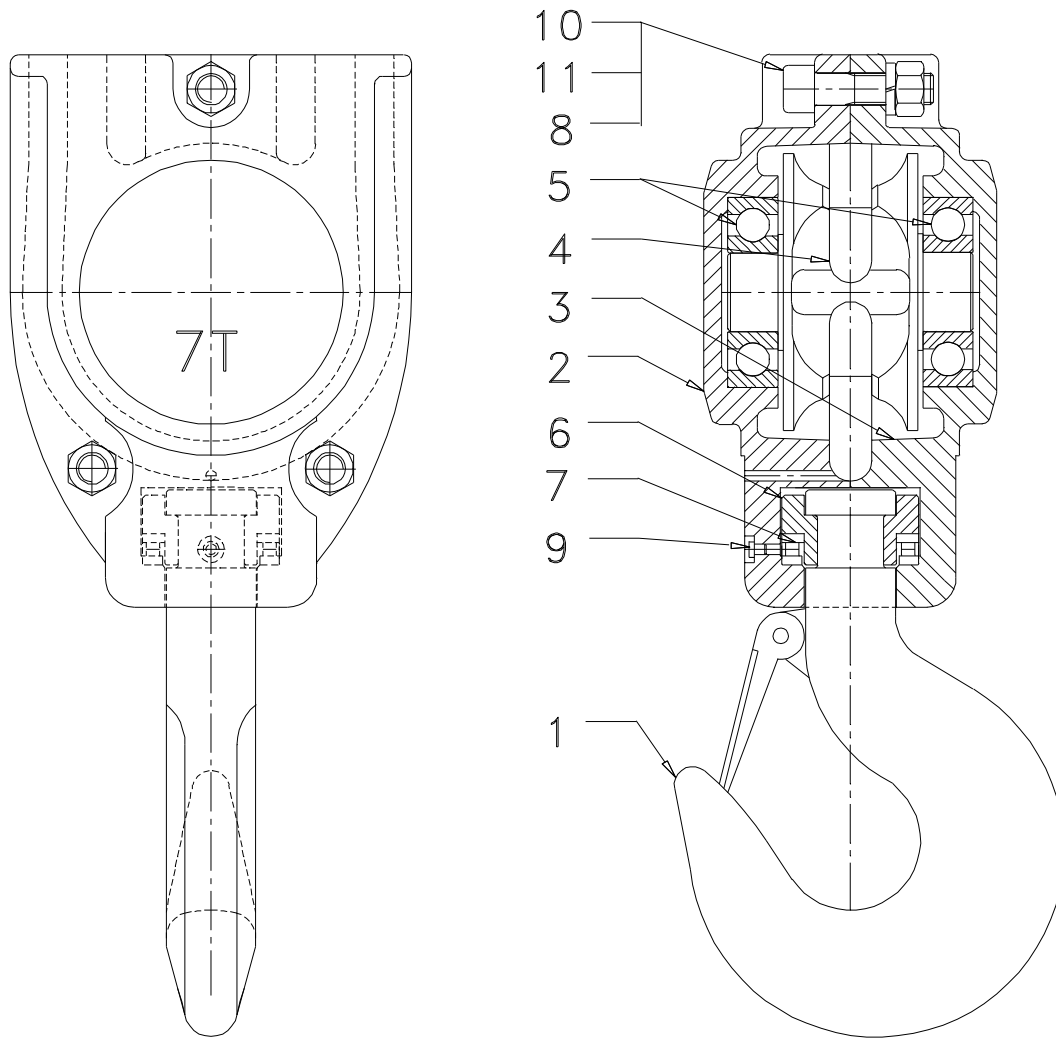
BOTTOM HOOK ASSEMBLY DRAWING & PARTS LIST LCA060S



DWG: D5260002

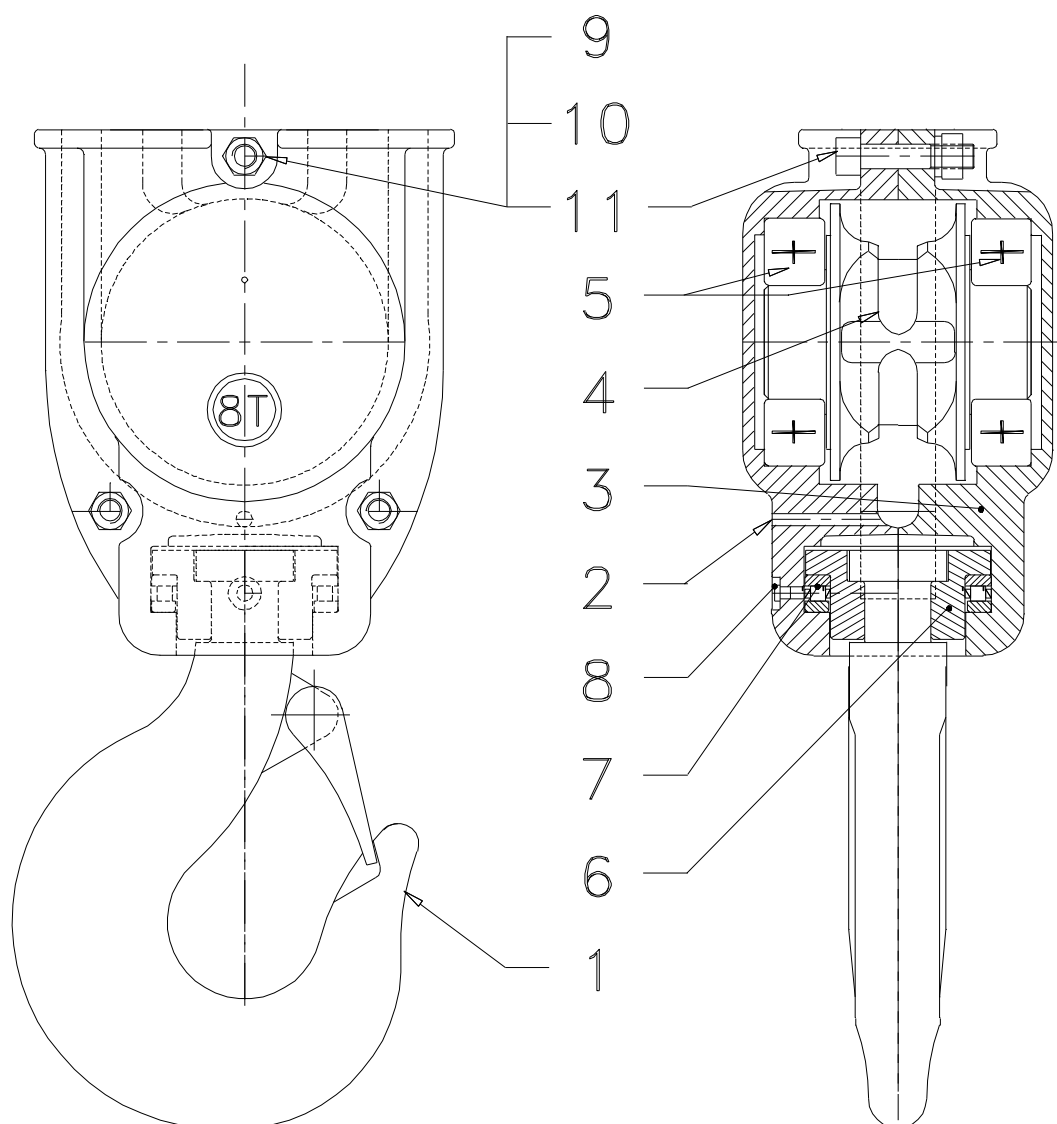
Rep Item	Désignation	Description	Qté. Qty.	CODE	
				STANDARD	OPTION 'R'
1	CROCHET 6T	6T HOOK	1	9.412.0395	9.412.0402
2	½ SUPPORT CROCHET(+gr.)	½ HOOK SUPPORT	1	9.526.0138	9.526.0144
3	½ SUPPORT CROCHET	½ HOOK SUPPORT	1	9.526.0139	9.526.0143
4	BAGUE EPAULEE(en 2	SHOULDERED RING	1	9.412. 0398	
5	BUTEE	STOP	1	5.470.0007	
6	GRAISSEUR	GREASER	1	6.710.2627	
7	VIS CHC	SCREW	2	4.133.0006	
8	ECROU	NUT	2	4.300.6911	
9	RONDELLE FREIN	LOCKWASHER	2	4.520.1010	
10	VIS CHC	SCREW	1	9.526.0037	
11	ECROU	NUT	1	4.300.4011	
12	RONDELLE FREIN	LOCKWASHER	1	4.520.1020	

BOTTOM HOOK ASSEMBLY DRAWING & PARTS LIST LCA070D



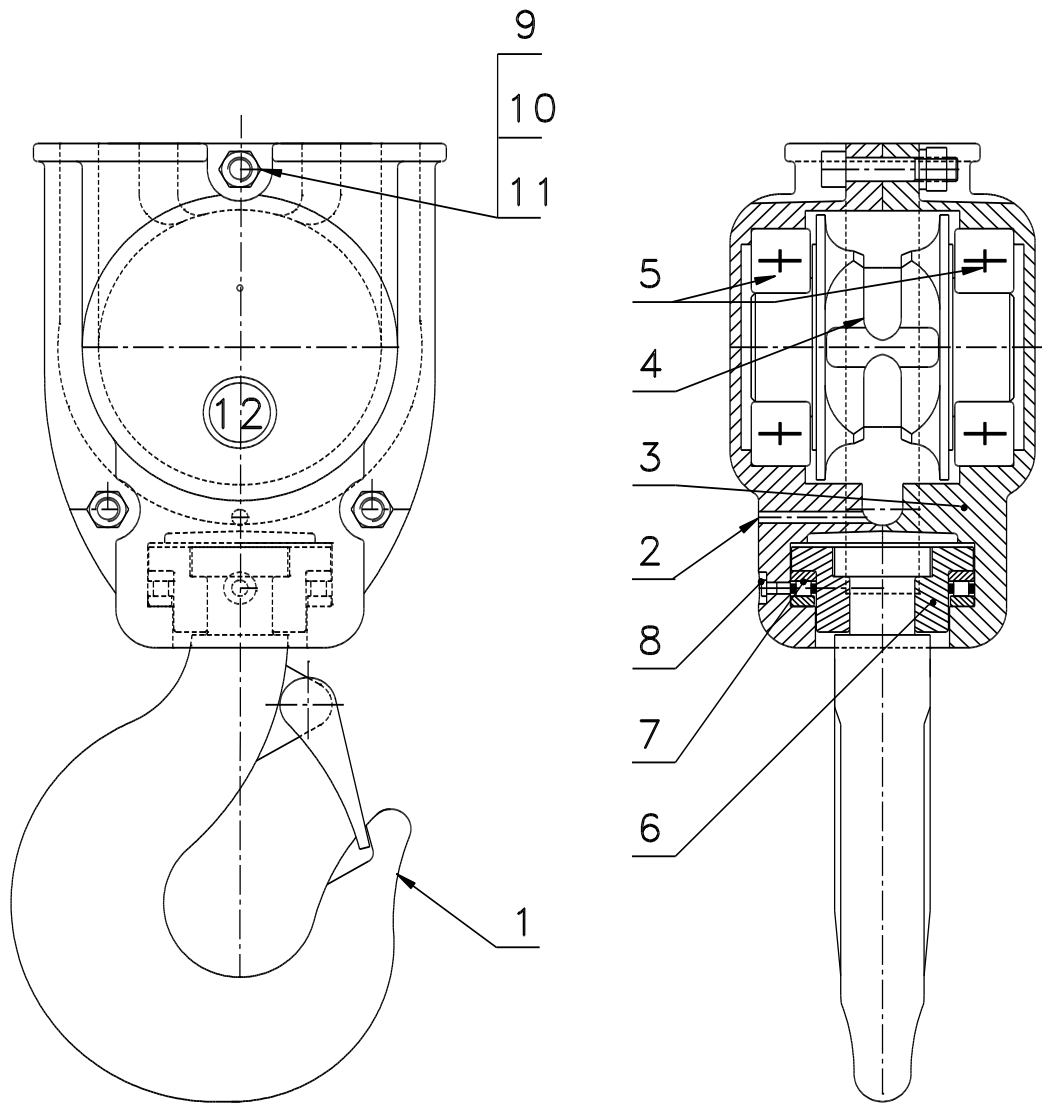
Rep Item	Désignation	Description	Qté. Qty.	CODE
				STANDARD
1	CROCHET	HOOK	1	9.412.0575
2	FLASQUE DE MOUFLE(+gr.)	BOTTOM BLOCK FLANGE	1	9.412.0574
3	FLASQUE DE MOUFLE	BOTTOM BLOCK FLANGE	1	9.412.0573
4	NOIX DE CHAINE	CHAIN SPROCKET WHEEL	1	9.412.0113
5	ROULEMENT A BILLES	BALL BEARING	2	5.025.0006
6	BAGUE EPAULE (2PIECES)	SHOULDERED RING	1	9.412.0398
7	BUTEE	STOP	1	5.470.0007
8	RONDELLE W12	LOCKWASCHER	3	4.520.1012
9	GRAISSEUR	GREASER	1	6.710.2627
10	VIS	SCREW	3	4.132.4406
11	ECROU	NUT	3	4.300.3611

BOTTOM HOOK ASSEMBLY DRAWING & PARTS LIST LCA080D



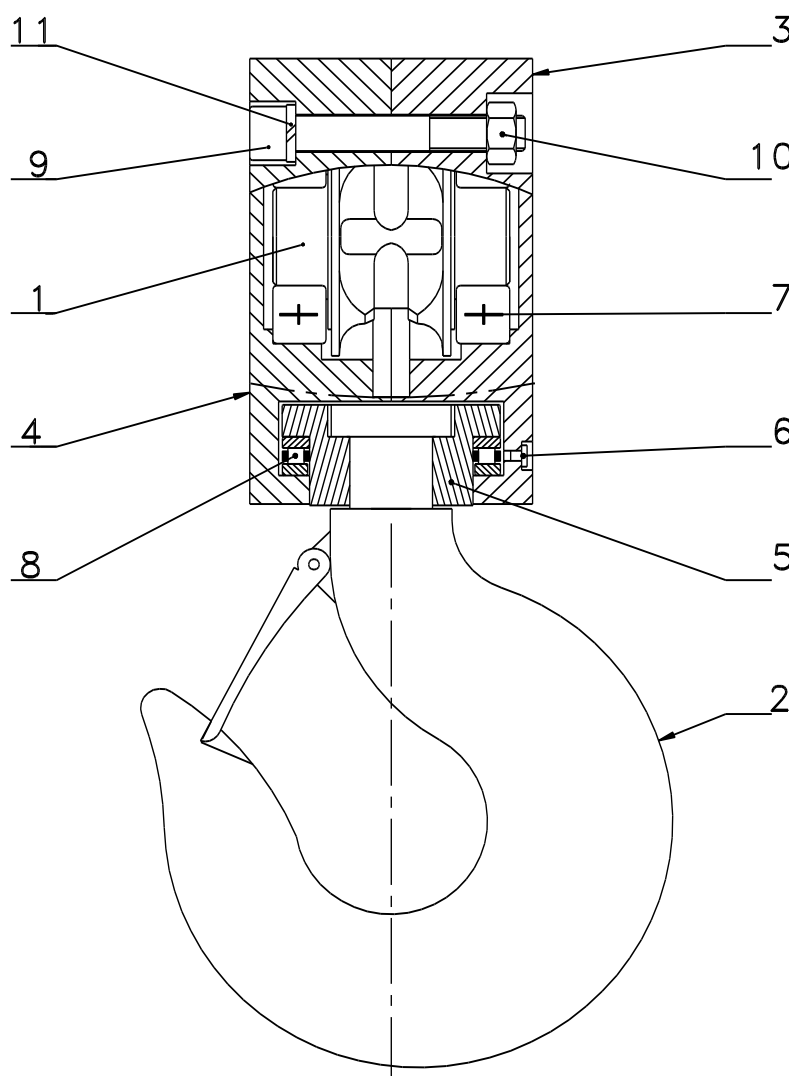
Rep Item	Désignation	Description	Qté. Qty.	CODE
				STANDARD
1	CROCHET	HOOK	1	9.623.8234
2	FLASQUE DE MOUFLE(+gr.)	BOTTOM BLOCK FLANGE	1	9.526.0287
3	FLASQUE DE MOUFLE	BOTTOM BLOCK FLANGE	1	9.526.0286
4	NOIX DE CHAÎNE	CHAIN SPROCKET WHEEL	1	9.526.8006
5	ROULEMENT A BILLES	BALL BEARING	2	5.025.0011
6	BAGUE EPAULE (2PIECES)	SHOULDERED RING	1	9.623.0014
7	BUTÉE	STOP	1	5.470.0013
8	GRAISSEUR	GREASER	1	6.710.0827
9	RONDELLE W12	LOCKWASHER	3	4.520.1012
10	VIS	SCREW	3	4.131.0306
11	ECROU	NUT	3	4.300.3611

BOTTOM HOOK ASSEMBLY DRAWING & PARTS LIST LCA120D



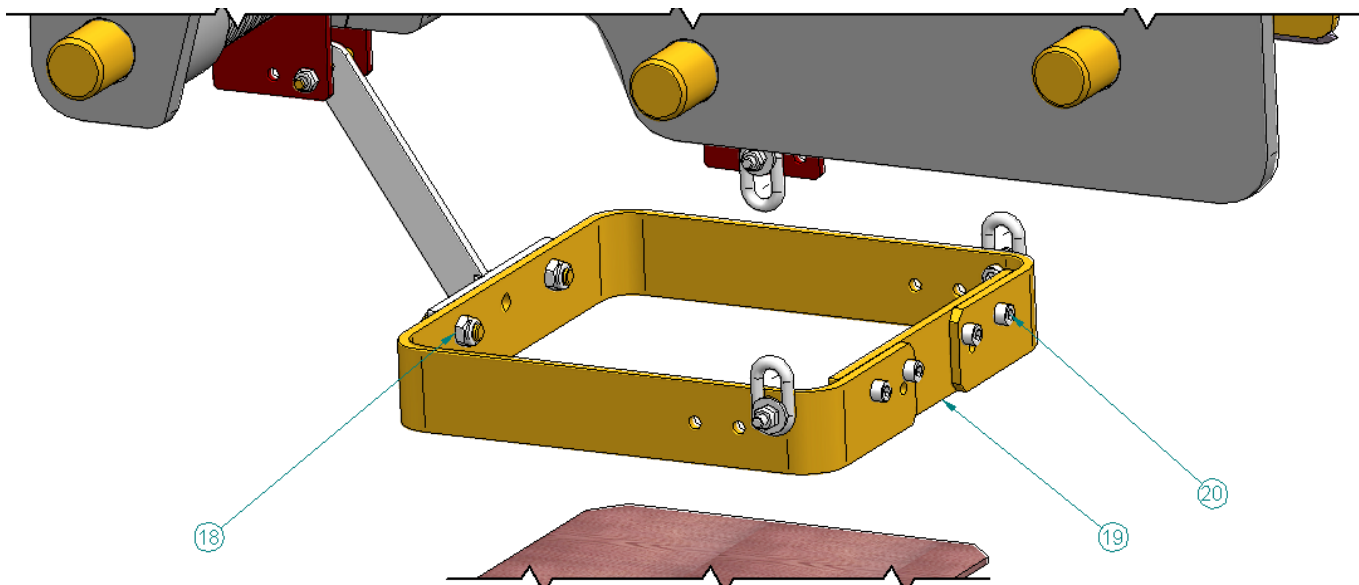
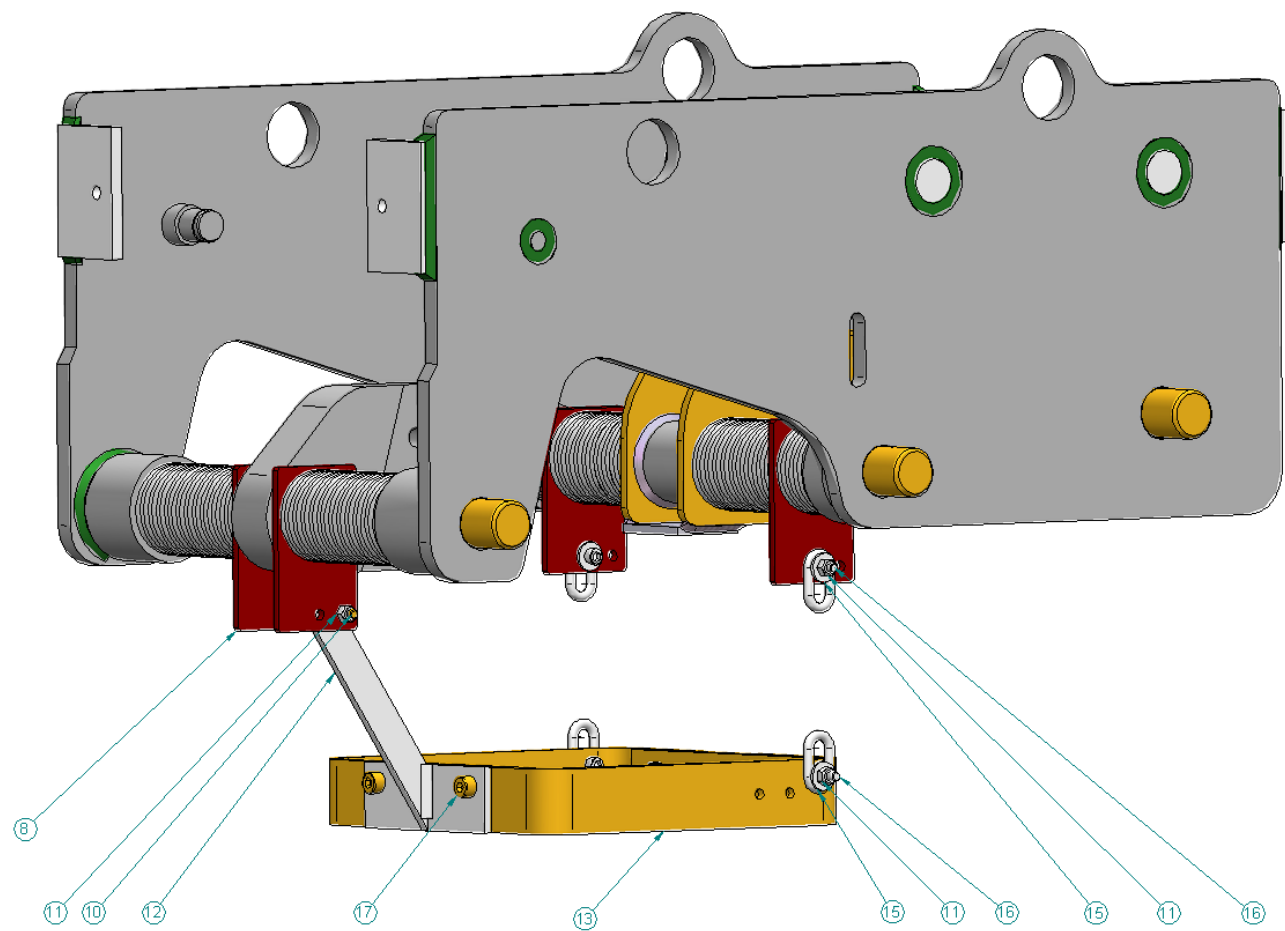
Item No.	Description Of part	Qty. total	Part number	
			STANDARD	OPTION 'R'
1	12T HOOK	1	9.623.8234	9.623.0168
2	BOTTOM BLOCK FLANGE	1	9.526.0136	9.526.0142
3	BOTTOM BLOCK FLANGE	1	9.526.0137	9.526.0141
4	CHAIN SPROCKET WHEEL	1	9.526.0006	9.526.0104
5	BALL BEARING	2	5.025.0011	
6	SHOULDERED RING	1	9.623.0014	
7	STOP	1	5.470.0013	
8	GREASER	1	6.7100827	
9	SCREW	3	4.132.3106	
10	NUT	3	4.300.3611	
11	LOCKWASHER	3	4.520.1012	

BOTTOM HOOK ASSEMBLY DRAWING & PARTS LIST LCA250Q

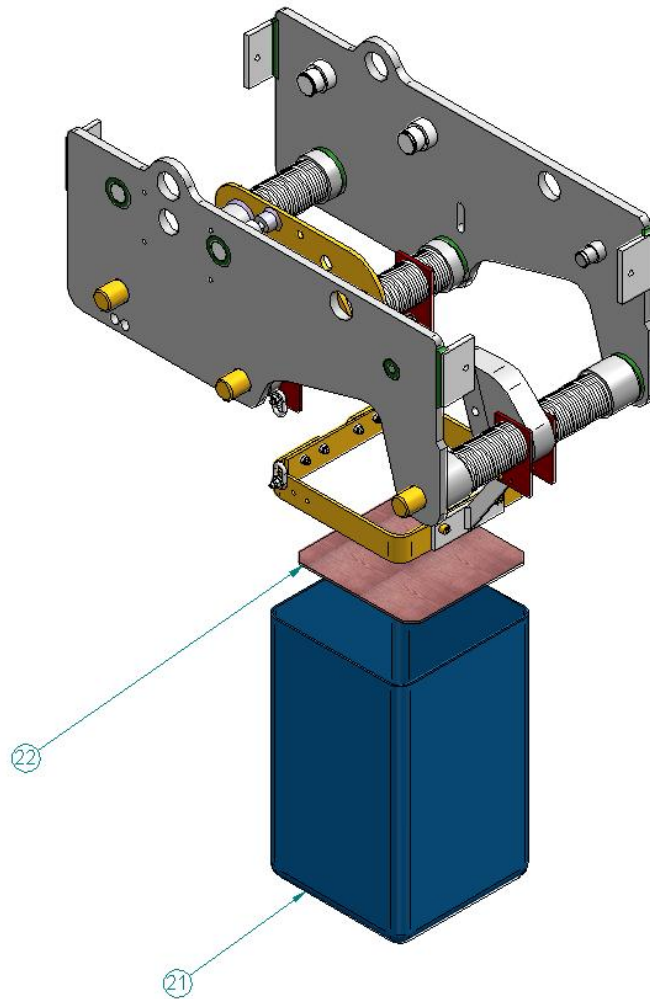


Rep Item	Désignation	Description	Qté. Qty.	CODE	
				STANDARD	OPTION 'R'
1	Noix de chaine	Sprocket wheel	1	9526-8006	9526-8106
2	Crochet 25T	25T Hook	1	9623-8233	9623-8169
3	Flasque de moufle	Bottom BlockFlange	1	9596-8077	
4	Flasque de moufle	Bottom BlockFlange	1	9596-8078	
5	Bague épaulée (2 pièces)	Shouldered ring (2 parts)	1	9623-7026	
6	Graisser	Greaser	1	6710-0827	
7	Roulement à billes	Ball Bearing	4	5025-0011	
8	Butée à rouleaux	Thrust Roller Bearing	1	5470-0018	
9	Vis CHC M20	Screw	3	4132-3906	
10	Ecrou H M20	Nut	3	4300-0811	4300-4011
11	Rondelle W20	Split Washer	3	4520-0020	4520-1020

CHAIN CONTAINER ASSEMBLY DRAWING & PARTS LIST LC2A015S/030D OPTION B

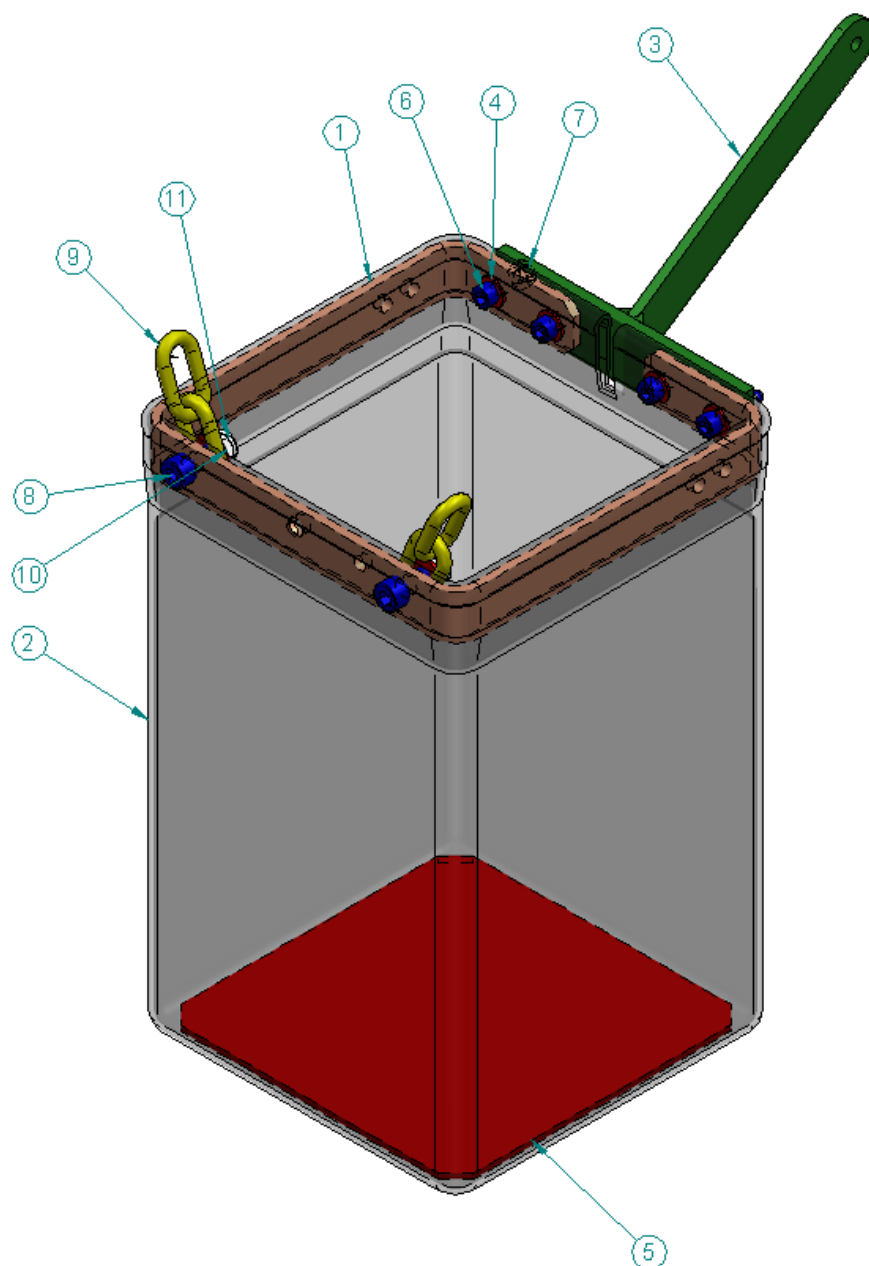


CHAIN CONTAINER ASSEMBLY DRAWING & PARTS LIST LC2A015S/030D OPTION B



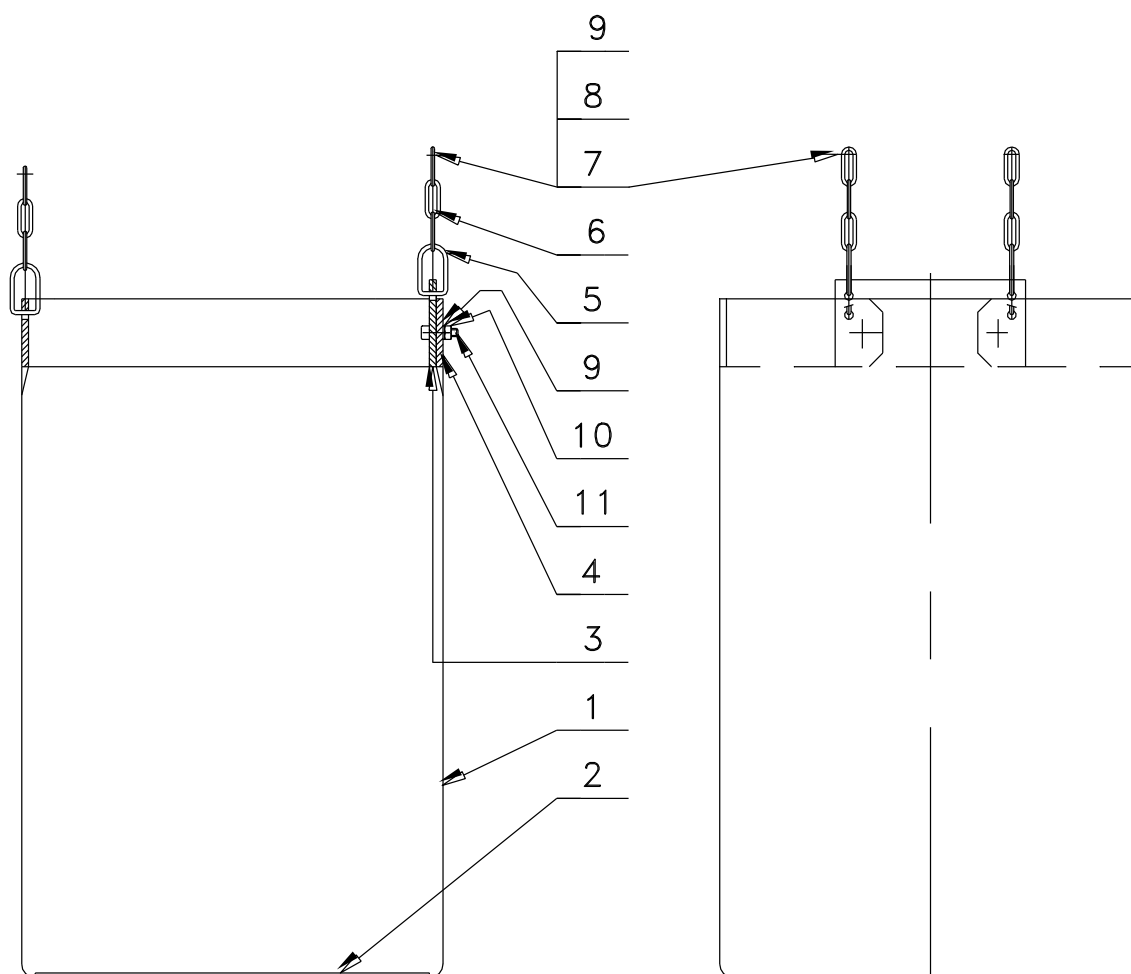
Rep Item	Désignation	Description	Qté. Qty.	CODE
8	Patte de fixation	Bracket	4	96440589
10	Vis CHC M06x55	Screw	1	41332206
11	Ecrou frein M06	Lock Nut	9	43707611
12	Support bac à chaîne	Chain Container Support	1	96440600
13	Support	Support	1	94120179
15	Rondelle plate LL6	Flat washer	6	45701006
16	Vis CHC M06x25	Screw	4	41312206
17	Vis CHC M08x20	Screw	2	41321806
18	Ecrou frein M08	Locknut	2	43706511
19	Plat	Flat	1	96440680
20	Vis CHC M06x20	Screw	4	41322206
21	Sac	Chain Container	1	94120177
22	Plaque de sac	Chain Container Flat	1	94120201

CHAIN CONTAINER ASSEMBLY DRAWING & PARTS LIST LC2A015S OPTION A



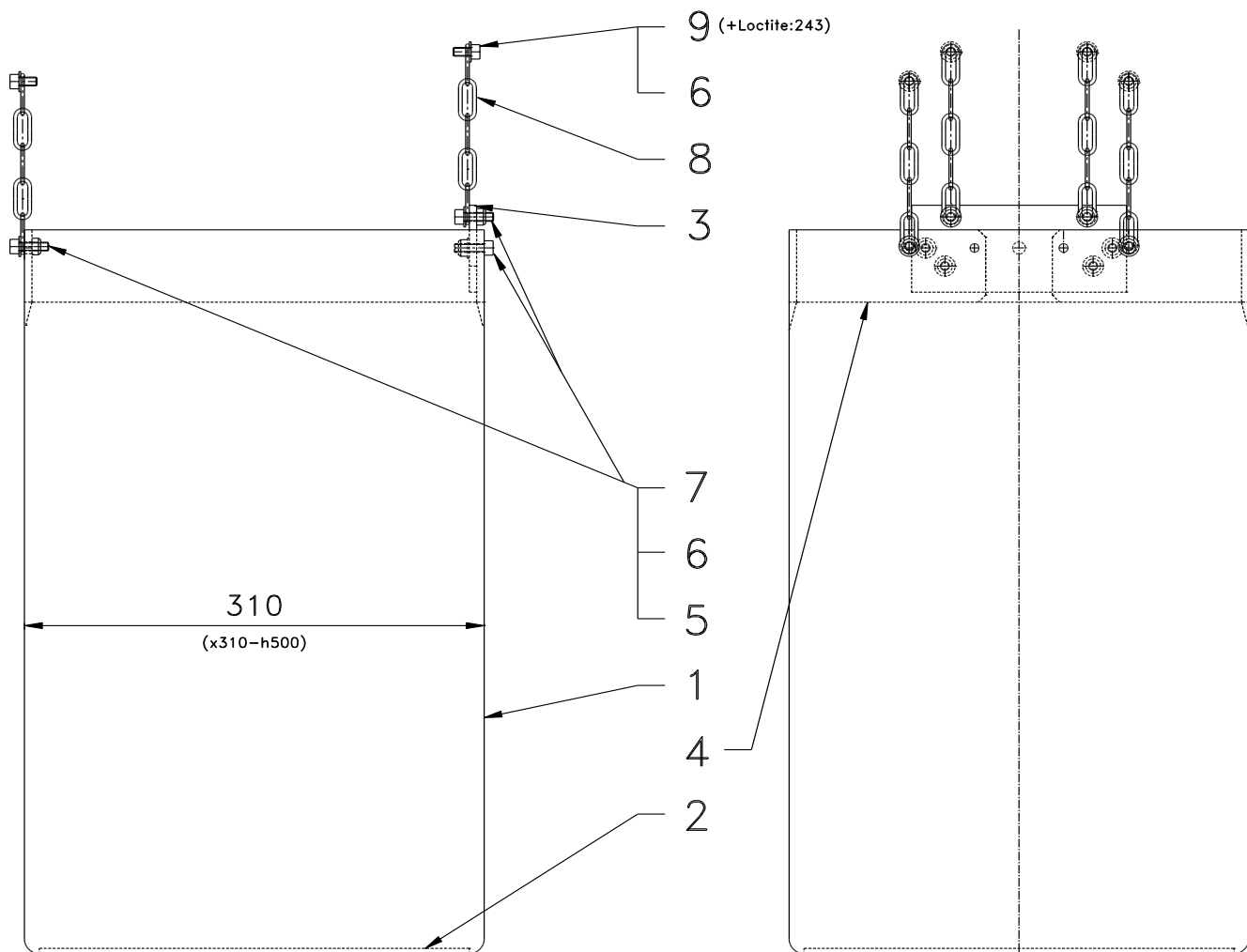
1	94240139	1	Support
2	94240137	1	Sac
3	96440672	1	Support bac a chaine
4	45001106	4	Rondelle plate M6
5	94240161	1	Plaque de sac
6	41312206	4	Vis CHC M6-25
7	43707611	4	Ecrou frein M 6
8	41324906	2	Vis CHC M8-25
9	69029232	4	maillon de chaine 6x22.66
10	45001108	2	Rondelle plate M8
11	43706511	2	Ecrou frein M8
N°	N° Doc.	Qté	Description

CHAIN CONTAINER ASSEMBLY DRAWING & PARTS LIST LCA030S/060D/070D



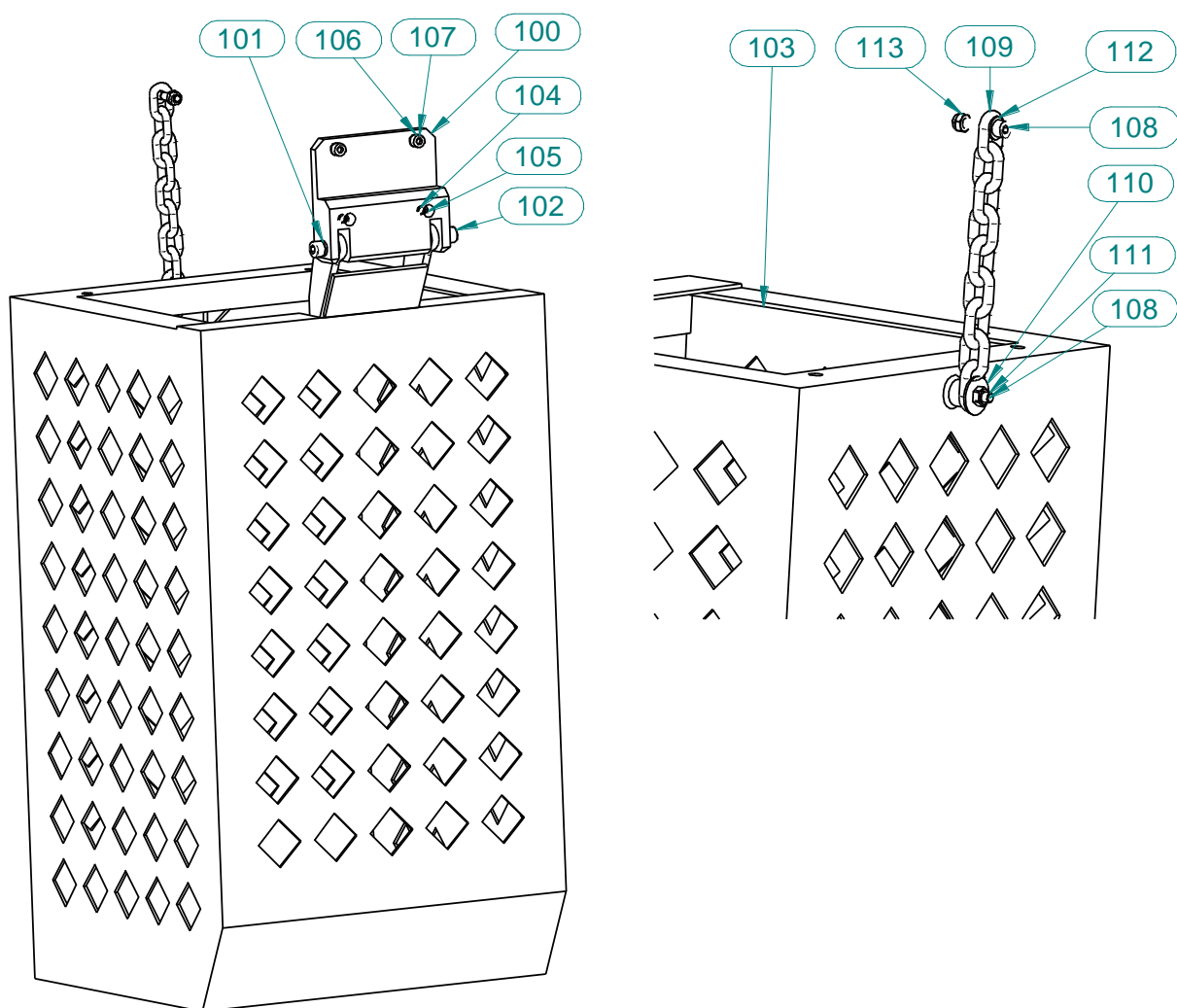
REP Item	DESIGNATION	DESCRIPTION OF PART	Qté. Qty.	CODE
1	Bac à chaine	Chain container	1	9412-0177
2	Plaque de sac	Plate	1	9412-0201
3	Guide de chaine	Chain Guid	1	9523-0119
4	Support de sac	Support	1	9412-0179
5	Boucle d'accrochage	Wire Loop	4	9053-0031
6	Chaine (3 maillons)	Chain (3 links)	4	6900-1332
7	Vis Chc M6x15	Screw	4	4132-2606
8	Rondelle M6	Flat Washer	4	4500-1106
9	Rondelle W6	Split Washer	6	4500-1006
10	Ecrou Hu M6	Nut	2	4300-6211
11	Vis Chc M6x20	Screw	2	4132-2206
	BAC A CHAINE CB6-12M	CHAIN BASKET CB6-12M		3523-0041

CHAIN CONTAINER ASSEMBLY DRAWING & PARTS LIST LCA060S TO LCA250Q



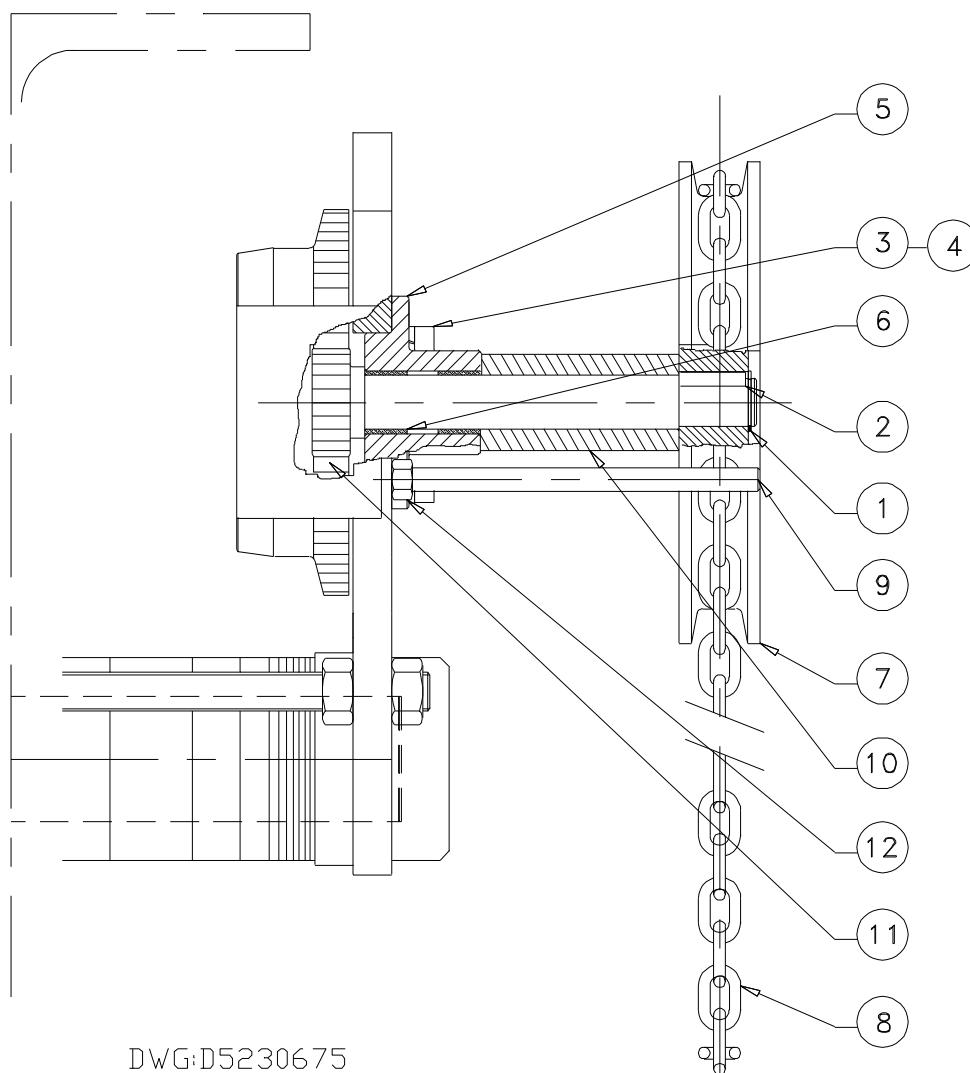
Rep Item	Désignation	Description	Qté. Qty.	CODE
1	BAC A CHAINE (12m)	CHAIN CONTAINER	1	95260056
2	PLAQUE	PLATE	1	95260057
3	GUIDE CHAINE	CHAIN GUIDE	1	95260171
4	SUPPORT DE BAC	SUPPORT BASKET	1	95260054
5	VIS	SCREW	8	41322206
6	RONDELLE M6	WASHER	12	45001106
7	ECROU FREIN	LOCKNUT	8	43707611
8	CHAINE (4x5maillons)	CHAIN	0.485m	69029232
9	VIS CHc	SCREW	4	41324306

(OPTION B)CHAIN CONTAINER ASSEMBLY DRAWING & PARTS LIST
LCA180T TO LCA250Q



Rep Item	Désignation	Description	Qté. Qty.	CODE
100	Attache		1	95960131
101	Rondelle élastique W10	Lock Washer	2	45201010
102	Axe d'articulation	Axle	2	95960132
103	Bac à chaîne	Chain container	1	95260162
104	Rondelle élastique W6	Lock Washer	2	45201006
105	Vis CHC M6x30	Screw	2	41322306
106	Rondelle élastique W8	Lock Washer	3	45201008
107	Vis CHC M08x25	Screw	2	41324906
108	Vis CHC M08x40	Screw	2	41326706
109	Chaîne	Chain		69089432
110	Rondelle plate LL8	Flat washer	1	45701008
111	Ecrou H M8	Nut	1	43003511
112	Rondelle plate M8	Flat washer	1	45701108
113	Ecrou frein M8	Lock Nut	1	43706511

ROPE CONTROL ASSEMBLY DRAWING LCA030S to LCA120D



Rep Item	Désignation	Description	Qté. Qty.	CODE
1	CIRCLIPS	CIRCLIPS	1	47700025
2	CLAVETTE	KEY	1	95230029
3	VIS CHC	SCREW	3	41323506
4	RONDELLE FREIN	LOCKWASHER	3	45201010
5	PALIER	BEARING	1	95230027
6	BAGUE AUTO-LUBRIFIANTE	SELF-LUBRIFICATING RING	2	59104926
7	VOLANT DE MANŒUVRE	WHEEL	1	95230028
8	CHAINE DE MANŒUVRE	CHAIN	M	69029232
9	TIGE FILETEE	SCREW ROD	1	95230118
10	BAGUE ENTRETOISE	DISTANCE WASHER	1	95230117
11	PIGNON	PINION	1	95230116
12	ECROU	NUT	2	43003611

PARTS ORDERING INFORMATION

The use of replacement parts other than INGERSOLL-RAND Material Handling will invalidate the Company's warranty. For prompt service and genuine INGERSOLL-RAND Material Handling parts, provide your nearest Distributor with the following :

1. Complete model number and serial number as it appears on the nameplate.
2. Part number and part description as shown in this manual.
3. Quantity required.

For your convenience and future reference it is recommended that the following information be recorded.

Hoist Model Number
Hoist Serial Number
Date Purchased

Return Goods Policy

INGERSOLL-RAND will not accept returned goods for warranty or service unless prior arrangements have been made and written authorization has been provided from the location the goods were purchased.

NOTICE

- **Continuing improvement and advancement of design may cause changes to this trolley which are not included in this manual. Manuals are periodically revised to incorporate changes. Always check the manual edition number on the front cover for the latest issue.**

When the life of the trolley has expired, it is recommended that the trolley be disassembled, degreased and parts separated as to materials so that they may be recycled.

For additional information contact :

INGERSOLL-RAND Material Handling
529, avenue Roger Salengro
59450 Sin-le-Noble - France
Phone : (33) 27-93-08-08
Fax : (33) 27-93-08-00

NOTICE

- **Mineral based oils are recyclable, however, some oils such as glycols may be extremely toxic and must be identified and disposed of at an approved waste or disposal site in accordance with all local, state and federal laws and regulations.**

GUARANTEE

See our general conditions of sales mentioned on our proposal, acknowledgement receipt, invoice.

INGERSOLL-RAND guarantees the equipment sold and supplied by itself against any defect or flaw in manufacture or operation under the conditions and within the limits hereafter.

- the guarantee is only valid if the customer has satisfied the general obligations of the present contract and, in particular, of settlement.

- the guarantee is strictly limited to INGERSOLL-RAND equipment. It does not extend to supplies and accessories which are not of its manufacture.

- the guarantee does not extend to assemblies or machines in which INGERSOLL-RAND equipment is incorporated and in particular to the performances of these assemblies or machines.

- when INGERSOLL-RAND equipment is incorporated into one or other assembly or machine by the customer, he alone is responsible for the adaptation, the choice and the suitability of the INGERSOLL-RAND equipment, INGERSOLL-RAND's diagrams, surveys and layouts being given only for guidance, unless there is a special stipulation in the acceptance of order, defined in the acknowledgment of receipt.

- INGERSOLL-RAND does not guarantee components and accessories it does not sell.

Defects in fitting, adaptation, design, connection and running of the assembly or part of the assembly put together by the customer are not covered by the guarantee. INGERSOLL-RAND equipment and material as well as the assemblies or machines set up by the customer or by a third party are assumed to be operated and used under the sole control of the customer or third party.

- The duration of the guarantee is for 6 months from the start up of the equipment by the customer. The start up must be made at the latest three months after dispatch of the equipment or its being made available.

- INGERSOLL-RAND has the right to demand from its customer proof of the date of start up.

- The guarantee period is reduced to half if the equipment is used day and night.

- The length of guarantee is neither prolonged nor interrupted by either amicable or litigious claims by the customer.

- At the expiry of this period, the guarantee ceases uncontestedly.

- The obligations of the INGERSOLL-RAND guarantee will only come into effect if the customer proves that the defect or flaw appeared during normal operating conditions for this type of material, or in the course of normal use as specified by INGERSOLL-RAND.

- It does not apply in the event of user's mistake, negligence, imprudence, faulty supervision or maintenance, inattention to the instructions or directions for use of low quality lubricants.

INGERSOLL-RAND liability is disclaimed for all damage brought about by loss or leaks of oil.

- No guarantee applies either for fortuitous incidents or force majeure, or for wear, replacements or repairs caused by normal use of the equipment.

- The guarantee is restricted to reconditioning in INGERSOLL-RAND's premises at its expense and as soon as possible the equipment and parts recognized as faulty by its technical or after sales services, which are sent carriage paid and packing free, without there being any claim for damage arising, such as injury to personnel, damage to property other than that covered by the present contract, loss of possession, of production, commercial detriment or loss of profit.

- During the guarantee period, the cost of labour for dismantling and reassembling equipment outside INGERSOLL-RAND's premises, the cost of moving faulty, replaced or repaired equipment and the travelling and living expenses of INGERSOLL-RAND's engineers are covered exclusively by the customer.

- In order to obtain the advantages of the guarantee, the customer must advise INGERSOLL-RAND without delay and in writing of the defects and flaws in his equipment of which he is complained and furnish proof of their genuine nature. He must give INGERSOLL-RAND or its agents or technicians every facility to verify the defects or flaws and to put them right.

- The guarantee does not apply if the equipment is returned to INGERSOLL-RAND in a condition other than in which it broke down or if the seal has been removed, or if it has been dismantled, repaired or modified by a third party, or by the user or the customer.

- After having been duly informed of the defect or flaw in its equipment, INGERSOLL-RAND will put it right as quickly as possible, reserving the right, in certain cases, to modify the whole or part of the equipment so as to meet its obligations.

- The customer agrees that INGERSOLL-RAND will not be responsible for damage in the event that the customer has not fulfilled one or other of the obligations set out above.

- Parts replaced free of charge remain the property of INGERSOLL-RAND.

- The guarantee does not apply to wearing parts.

IMPORTANT NOTICE

It is our policy to promote safe delivery of all orders. This shipment has been thoroughly checked, packed and inspected before leaving our plant and receipt for it in good condition has been received from the carrier. Any loss or damage which occurs to this shipment while enroute is not to any action or conduct of the manufacturer.

Visible loss or damage

If any of the goods called for on the bill of lading or express receipt are damaged or the quantity is short, do not accept them until the freight or express agent makes an appropriate notation on your freight bill or express receipt.

Concealed loss or damage

When a shipment has been delivered to you in apparent good condition, but upon opening the crate or container, loss or damage has taken place while in transit, notify the carrier's agent immediately.

Damage claims

You must file claims for damage with the carrier. It is the transportation company's responsibility to reimburse you for repair or replacement of goods damaged in shipment. Claims for loss or damage in shipment must not be deducted from the INGERSOLL-RAND invoice, nor should payment of INGERSOLL-RAND invoice be withheld awaiting adjustment of such claims as the carrier guarantees safe delivery. You may return products damaged in shipment to us for repair, which services will be for your account and form your basis for claim against the carrier.

United States Office Locations

For Order Entry and Order Status :

Ingersoll-Rand Distribution Center

P.O. Box 618
510 Hester Drive
White House, TN 37188
Phone: (615) 672-0321
Telex: 786573
Fax: (615) 672-0801

For Technical Support:

Ingersoll-Rand Material Handling

P.O. Box 24046
2724 Sixth Avenue South
Seattle, WA 98124-0046
Phone: (206) 624-0466
Telex: 328795
Fax: (206) 624-6265

Regional Sales Offices

Atlanta, GA

111 Ingersoll-Rand Drive
Chamblee, GA 30341
Phone: (404) 936-6230

Detroit, MI

23192 Commerce Drive
Farmington Hills, MI 48335
Phone: (313) 476-6677
Fax: (313) 476-6670

Houston, TX

Suite 150
2500 East T.C. Jester
Houston, TX 77008
Phone: (713) 864-3700

Los Angeles, CA

5533 East Olympic Blvd.
Los Angeles, CA 90022
Phone: (213) 725-2826

Milwaukee, WI

12311 W Silver Sping Dr.
Milwaukee, WI 53225
Phone: (414) 461-0973

Philadelphia, PA

P.O. Box 425
900E. 8th Ave., Suite 103
King of Prussia, PA 19406
Phone: (215) 337-5930

International

Offices and distributors in principal cities throughout the world. Contact the nearest **Ingersoll-Rand** office for the name and address of the distributor in your country or write/fax to:

Ingersoll-Rand Material Handling

P.O. Box 24046
2724 Sixth Avenue South
Seattle, WA 98124-0046
USA
Phone: (206) 624-0466
Telex: 328795
Fax: (206) 624-6265

Canada

National Sales Office Regional Warehouse Toronto, Ontario

51 Worcester Road
Rexdale, Ontario
M9W 4K2
Phone: (416) 675-5611
Fax: (416) 675-6920
Order Desk
Fax: (416) 674-6549

Regional Sales Offices

Calgary, Alberta

333 11th Avenue S.W.
Calgary, Alberta
T2R 0C7
Phone: (403) 261-8652

Edmonton, Alberta

1340 Weber Center
5555 Calgary Trail N.W.
Edmonton, Alberta
T6H 5G8
Phone: (403) 438-5039
Fax: (403) 437-3145

Montreal, Quebec

3501 St. Charles Blvd.
Kirkland, Quebec
H9H 4S3
Phone: (514) 695-9040
Fax: (514) 695-0963

British Columbia

201-6351 Westminster Hwy

Richmond, B.C.
V7C 5C7
Phone: (604) 278-0459
Fax: (604) 278-2519

Latin America Operations Ingersoll-Rand Production Equipment Group

730 N.W. 107 Avenue
Suite 300, Miami, FL
33172-3107
Phone: (305) 559-0500
Telex: 441617TLS UI
Fax: (305) 559-7505

Europe, Middle East and Africa

Ingersoll-Rand Equipements de Production S.A.

529, avenue Roger Salengro
59450 Sin le Noble, France
Phone: (33) 27.93.08.08
Fax: (33) 27.93.08.00

Asia - Pacific Operations Ingersoll-Rand (Japan) Ltd.

Kowa Bldg. No. 17
2-7 Nishi-Azabu 1-chome
Minato-ku, Tokyo 106,
Japan
Phone: (03) 3403-0641/7
Fax: 81 3 3401-2049

Russia

Ingersoll-Rand Company

World Trade Center
Office 1101
Krasnopresnenskaya
Nab.12
Moscow, Russia 123610